A WORLD WITH POWERS

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(PhD dissertation)

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PREFACE

I started working on powers in my undergrad years, and although since then I have worked on great many other topics, to powers I have always returned. My MA thesis mostly dealt with the conditional analysis of dispositions, and my PhD project originally aimed to a dispositionalist account of physical modality (or perhaps metaphysical, I was not sure at the time).

I soon realized that it simply wasn't possible. An ontology of powers is occasionally said, by its supporters, to be preferable to an ontology of possible worlds: it is considered an "actualist" and "naturalist" account of modality, a safe and sane ontology more in line with XX century science than the baroque structure of possible worlds that we can read off standard modal semantics. Yet the more I delved into the literature about powers, the more I tried to understand the kind of ontology that its supporters were trying to put forward, and the more the whole issue seemed to elude me, and slip between my fingers. For some time I had the distinct feeling that I only had a tenuous grasp on many of the claims of these "friends of powers" –as I will call them throughout this thesis. I also had the feeling that no one was really better off than me. The debate seemed, to some extent, to be wrapped in darkness.

I surely felt, as many did, the explanatory power that dispositionalist accounts were capable of, in various areas of metaphysics and philosophy of science; I am a friend of powers myself, or rather, I would very much like to be one. Yet it seemed to me that this vast family of loosely interconnected dispositionalist accounts lacked solid foundations: the background metaphysics, the power ontology itself, was not clear. Thus my project slowly, but steadily, evolved into an attempt to make the jungle of powers something a little more livable: thus, this thesis.

As the work was underway, a number of philosophers put forward accounts and observations that, at least loosely, resembled mine. This was an exciting discovery to me. For one, my crucial notion of "weak power" ("W-power") which I first introduce in Chapter 3 to account for an ontologically innocent kind of dispositional talk, strictly resembles Bird's (2016) dispositions as "predicatory properties". Relatedly, we both voice a worry that I'm sure many philosophers working on powers have felt: that many so-called "applications" of dispositions to the most disparate areas of philosophy, are most often than not completely orthogonal to power ontology proper.

Sometimes, I felt an emboldening synergy of intent. When I arrived in Nottingham to work under the supervision of Stephen Mumford, there were two other PhD students working on powers, two wonderful people that I'm glad I met: Donatella Donati and Andrea Raimondi. Both of them engaged in somewhat clarifying projects in the background metaphysics of powers: they too, like me, were trying to make their way into the jungle of power ontology. Donatella was trying to establish the compatibility of power ontology (specifically, the one in Mumford and Anjum 2011) with various theories in the metaphysics of time, mostly eternalism, presentism and growing block theory; whereas Andrea was trying to discover which theory of properties was best suited for the friend of powers. And I am sure we are not the only ones engaged in similar works.

In general, novelty is a double-edged blade in metaphysics: liberating, on the one hand, but obscure and possibly mysterious, on the other. Now that power ontology has (at least) a couple of decades under its belt, I think it is time to arrange its claims into something more structured and recognizable; perhaps part of the novelty will be lost in the operation, yet I take this to be an acceptable price to pay.

Back to this thesis, a grand variety of topics are discussed in the course of its nine chapters, and not all of them, as one can expect, are properly resolved. Some point in in fascinating new directions; let me mention at least two of them.

The first concerns the hyperintensional import of power ontology. This is not recognized enough. Although many philosophers have tried to define their favorite brand of power ontology through modality, one of the claims submitted in this thesis is that merely intensional (e.g. modal) tools may not be sufficient to discern a world with powers, from one without. I suspect that the reason this is not often recognized, is that the traditional adversary of a world with powers is the world of neo-Humean metaphysics, with its primitive and contingent distribution of properties at the rock-bottom, which easily allows to set up the distinction modally. Yet one can reject such contingencies without hereby accepting powers, for power ontology is not merely the rejection of neo-Humeanism, but something more specific.

This has wide-ranging consequences, the most important being that hyperintensional distinction are crucial in the articulation of realism about powers. Yet this is a claim one should thread carefully around. An exciting new development in metaphysics relates to hyperintensionality, traditionally considered peculiar to "epistemic" or otherwise representational phenomena such as belief and knowledge, rather than something carving very fine-grained distinctions in the outside world. Thus, if the distinction between a world with powers, and a world without, wants to be a metaphysically substantive and genuine distinction (as, I suppose, many friends of powers would want), one may want to explore the claim that hyperintensionality can sometimes have non-representational sources.

A second potential direction of enquiry concerns what I call the Governing Challenge; it is, as the reader will discover, a revamped old problem, which recent emphasis on (metaphysical) explanation now makes much more compelling: for their supporters, powers are supposed to govern and explain the regularities displayed in the physical world –yet how exactly do powers that? How can a successful explanation be provided as to why, say, water soluble things dissolve when immersed in water? What's the special ingredient of water solubility *qua* dispositional property, that compels its bearers to behave in one way rather than another? This second issue relates to the first one above, insofar as power ontology is not a rejection of neo-Humeanism to the extent that it displays (brute) necessities, but insofar as it is equipped with something –viz. powers– enriching the world of such necessities; in other words, the regularities and the necessities of the friend of powers are not primitive: they stand in the need of an explanation. Not many answers to the Governing Challenge have been put forward in the literature insofar. As for me, in this thesis I will discuss this challenge, yet I will not afford a clear-cut and all-encompassing resolution to it; the variegated and heterogeneous nature of power ontologies makes it impossible. This is an interesting consideration on its own, as it suggests that power ontology, as a departure from neo-Humean metaphysics, merely exists in a programmatic stage, and awaits for further developments.

Many people devoted their time and energy to help me in this project; more generally, it is only through the help of so many professors, colleagues, and friends, that I was able to become the philosopher and the person that I am today (I leave it to the reader to evaluate the exact magnitude of this compliment). Each one of them deserves –at the very least– my thanks.

First of all, I benefited from the invaluable help of my two supervisors, Massimo Mugnai (in Pisa) and Stephen Mumford (in Nottingham): without them, this thesis simply wouldn't exist –a clear-cut case of rigid existential dependence if there is one. Then again, I simply wouldn't have never gotten into ontology & metaphysics without Andrea Bottani's course during my undergrad years. I would also like to thank professor Mario Piazza of the SNS Pisa, who accompanied me in the last steps of my PhD.

Additionally, I would like to thank Andrea Borghini, who I met in my early undergrad days; Andrea often supported me, sometimes from afar, at a time when I was still unsure about the direction of my research and my career; similarly, Anna Marmodoro welcomed me at her *Power Structuralism* project at Corpus Christi College, Oxford, during Trinity Term 2013 –before I began my PhD.
When I was in Pisa I was lucky to meet so many talented and friendly people in the class of philosophy; thus, I would like to thank Irene Binini, Martina Botti, Michele Ginammi, Giorgio Lando, Osvaldo Ottaviani, Andrea Strollo, Valentina Morotti, and Giacomo Turbanti. Roberto Gronda enthusiastically read and commented the first Chapter of this thesis, but unfortunately the rest came too late for him to read.
More generally, I discussed topics of this thesis, or loosely related topics, with a number of people, that I also would like to thank: Valdi Ingthorsson read and commented Chapter 7. In that Chapter, I also cite an unpublished paper by Ralf Busse on the identity regress against pure powers, which I had the luck of discussing with him back in 2015; the author gave me permission to cite his manuscript. Barbara Vetter commented on vast portions of Chapter 6 during a workshop on her book *Potentiality* (organized by Simone Gozzano and Giorgio Lando). Long talks with Massimiliano Carrara, not only on philosophy, helped me in the final year of my PhD.
I would also like to thank anyone who took their time to attend my talks at conferences, often condensed extracts of this thesis; especially anyone amongst them who asked questions –for sometimes a five-minutes fresh perspective is more valuable than two weeks of intellectual grind. And most importantly, I would like to thank any and all friends I've made in these years of philosophy and travels: it has been fun.
Finally, on a more personal note, I would like to thank my family: my mother, my father, my sister and her son. I wasn't the best son, brother nor uncle; my attention was often captured by this or that problem that I was trying to solve in order to write a paper or prepare a talk. That never seemed to matter, but I came to realize that it was because of the great amount of love that I was receiving, perhaps undeservedly, from all of them.
Most importantly, I would like to thank you –Valeria–, who also had to suffer from a fair amount of absent-mindedness and mood swings from my part. This was the only thing I could think of to surprise you more than you've surprised me.

PS. The editorial office of *Synthese* allowed me reprint significant portions of chapters 3 and 9, published as *The Question of Realism for Powers*.

CHAPTER ONE
INTRODUCTION TO POWERS

1. A familiar picture

A number of linguistic entries appear to assign powers, dispositions, or capacities to objects. This is especially clear in the case of verbal expressions such as "be disposed to" or "be capable of", but modal auxiliaries like "can" might also be taken to do the same; after all, if Superman, who can fly, has a superpower –then I, who can walk, have some power too (albeit not as super). Similarly, a number of suffixes ("-ible", "-able", "-ile"…) generate adjectives that can be straightforwardly considered as assigning powers or dispositions to objects; e.g. "irascible", "malleable", "fragile"; other adjectives obey different rules, but are nonetheless clearly dispositional in character, like "elastic" (viz., something that can stretch without breaking).

At any rate, this is but a linguistic observation about the proliferation of dispositional terminology in natural language. My interest is not so much in dispositional language itself, but in what such language is describing –the metaphysics backing this picture of a world in which powers and dispositions are assigned to objects.[1] This is a picture that almost everyone is familiar with: a world of objects, some of them fragile, or soluble, or resilient, but also a world of people, some of them irascible and some of them amiable; in short, a world in which entities are described and categorized, amongst other things, as they can behave, or as they are bound to behave in a given circumstance; a world, so to speak, "full of threats and promises" (Goodman 1954: 40). The scientific picture of the world also appears to take the idea of objects possessing dispositions very seriously –if, again, we are to take at face value the occurrence of dispositional lexicon in scientific language; for instance, gold is said to have a high degree of ductility (viz., a disposition to deform under tensile stress) and low degree of malleability (viz., a disposition to deform under compressive stress), while the other way round holds for lead. Such dispositions are often, but not always, assigned to objects for predictive purposes: knowing that gold is very malleable will be useful when predicting its behavior in experimental contexts. But the same thing holds in our everyday life –for example, you won't needlessly present an irascible colleague with a delicate problem: for you can predict an unfortunate outcome to that scenario. Relatedly, dispositions appear to play a crucial explanatory role in both scientific practice and everyday life. For example, malleability might be mentioned in the explanation of an unexpected result at abnormally high temperatures; and an outburst of anger at the workplace might be explained by mentioning someone's hot temper (e.g.: "as soon as I started talking, he just snapped. Why did he do that?", "Don't mind him. He is an irascible person.").

In this thesis, I will not directly argue whether or not there are powers. Rather, I will ask: *what if* there are powers? Namely, I will explore the background metaphysics of a world with powers. Since the late '70s, there has been a lively discussion between friends and foes of powers in both philosophy of science and metaphysics –but in more ways than one, the debate has been programmatic in character, and obscure in its details. People have been coming to powers from different angles, and it is difficult to assess how much of a cohesive and non-trivial stance is one merely characterized by the admission of powers in one's ontology. Supporters of different variants of power realism occasionally characterize their positions through non-equivalent or even wildly different claims –so much so that is not always

[1] In this thesis, I will use the terms "power" and "disposition" synonymously. As I will explain in the next Chapter, however, this constitutes an abstraction of philosophical English, since normally "power" has semantic connotations "disposition" lacks, and vice versa.

entirely clear where their agreement lies about "a world with powers". Claims that the world contains either "dispositionality", or its contrary, "categoricity", or both, or neither, are equally unclear, since the meaning of those words shifts uncontrollably from one source to the other. Unfortunately, even if many have claimed to be sympathetic to the idea of a world with powers, most of them failed to articulate what a world with powers will ultimately look like. Thus, this thesis functions as a clarification of the position of the friend of powers.

In general, I employ a top-down approach: first of all, by observing obscurities in contemporary debates around powers, I will begin by prescribing a clearer terrain of engagement between friends and foes of powers, a better way to formulate the debate itself. Secondly, I will try to assess what the admission of powers amounts to in one's ontology –what kind of entities we are really accepting in the ontology when we accept powers. Debates around the nature of "dispositionality" and, contrariwise "categoricity", occupy a significant part of this work. Even though, as I claimed, I will not directly argue for nor against powers, the availability of a non-trivial and problem-free power ontology might count as an argument in favor of powers; and, contrariwise, its absence could function as an argument against them. Finally, I will investigate whether (and to what extent) powers are compatible with the intuitive view of the world in which objects are bearers of intrinsic and monadic properties.

Since part of the goal is to outline a coherent stance for the friend of powers, I will help myself with any and all philosophical and logical tools I might need –although I will keep tabs of their independent costs. The reader will then decide for herself if the benefits are worth the costs.

This first introductory Chapter is structured as follows. In section 2 I will sketch an historically-minded introduction to powers, for the interested reader; although the impatient reader may rather prefer to skip it, it will introduce crucial considerations about powers, which will come in handy later on. Then, the main event: in section 3 I will present the goal of the thesis as a threefold objective; finally, in section 4, I will illustrate its structure, chapter by chapter. In the course of this introduction I will also anticipate some of my conclusions, for the impatient reader.

2. An historically-minded introduction to powers

2.1 A world full of potencies

The idea that objects are imbued with powers has a respectable philosophical pedigree: Aristotle, perhaps the most influential philosopher throughout the Middle Ages, held powers in high regard. The distinction between actuality and potentiality is very important for him, and in *Metaphysics* Θ he introduces a primary sense of potency (*δύναμις*) according to which potency is "a starting-point of change in another thing or in the thing itself *qua* other". This is what we could call an active power, immediately followed by the introduction of passive powers: "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".[2] A passive power might be a sugarcube's disposition to dissolve in water, while an active power might be the correspondent power of water to dissolve the sugarcube; thus, in the Aristotelian picture, the causal process of dissolution involves both an agent (the water) and a patient (the sugarcube) –something that acts, and something that is acted upon. Supposedly, the expression "*qua* other" is needed to cover the possibility that the active and passive causal actors are one and the same –viz., something, *qua* agent, acts on itself *qua* patient.

[2] *Metaphysics*, 1046[a] 9-18. All translations from Aristotle are from Barnes (1984).

Yet just how important powers are for Aristotle transpires in the debate with the so-called Megaric School, according to which "a thing can act only when it is acting, and when it is not acting it cannot act" (1046^b 29-30). In other words, the Megarics claim that powers only exist when they are manifested; thus, say, no one is capable of playing the guitar until one is actually playing it, and will be capable of doing so only insofar as one keeps playing it. If there are self-defeating positions, this might very well be amongst them; however Aristotle tries to elaborate what is wrong with it; mostly is the idea that the Megarics cannot reconstruct the difference between, say, someone who needs to take her time to learn how to play the guitar –and eventually does so without being capable to beforehand–, and an expert guitarist who effortlessly begins to play when her concert starts. Aristotle's conclusion (1047^a 11-20) is that "evidently potentiality and actuality are different; but these views make potentiality and actuality the same, so that it is no small thing they are seeking to annihilate." (for more examples and detailed discussion, see Molnar 2003, chapter 4). Thus, Aristotle accepts the existence of powers that are not manifested, and, though with some difficulty, even the existence of powers that will never be manifested, at any point of time (*De Interpretatione* 9, 19^a 13-14); for my coat may be cut in half, but may also wear out first (or be burned), before having the opportunity to manifest its disposition to be cut in half. Such a disposition that is acquired and then lost without ever being manifested, I will call "unmanifested".

Even if the Megarics do not flat-out claim that powers do not exist (only that they only exist when manifested), the defence of unmanifested powers sounds like a call for realism about powers *tout court*. In general, the acceptance of powers in one's ontology is inherently tied to the acceptance of a dimension of latency –for lack of a better word (e.g. Lipton 1999: 163). What would be the point in claiming "Superman can fly", if that was only to mean that Superman is flying right now? First of all, that would constitute redundant information, since one could just say "Superman is flying" (Vetter 2015: 94); but there are deeper philosophical reasons to be concerned about powers as conceived by the Megarics. For if powers were, in some sense, not distinct from their exercise –it would be quite hard to employ them for causal or explanatory purposes; how could a bottle's fragility cause or explain its breaking, if it were to just be its breaking? A weaker form of the Megaric view could claim that powers are distinct from their exercise, but still be possessed only insofar as they are exercised, as dictated by the original definition. One could still object that powers could not causally explain their exercise, since causal explanation allegedly requires temporal priority of the cause over the effect (for an objection to causal priority of causes, see Mumford and Anjum 2011). At any rate, such an anemic conception of powers is hardly appealing. Molnar (2003: 97) wrote:

> "It is hard to understand the concept of a power that exists precisely when it manifests and for exactly as long as it manifests. Is such a power something genuine, a property in its own right? It seems to be just a reification of the causal relation that holds whenever the power is exercised."

Quoting Mackie (1977: 366), Molnar goes on to claim that Megarics' powers are merely the result of "metaphysical double vision" –in which one counts the same power twice, one time as the power, and another as its exercise.[3]

Overall, the Aristotelian discussion against the views of the Megaric School can be taken to contain notable arguments in favor of the existence of powers; thus, there is a notion of power that Aristotle passed upon Middle Age Scholastic: according to this view, the world is inherently active, populated by

[3] I will say more on unmanifested powers in the course of the thesis, and especially in Chapter 6.

individual substances endowed with the potential for change, in themselves or something else; such a potential would be actualized by the exercise of powers.

2.2 A world without powers

Thus a world equipped with (possibly unmanifested) powers –viz. with potency as well as actuality– is not only both familiar to our everyday life and the scientific endeavor; it is also a philosophically respectable idea. However, it is an idea that has been rehabilitated only recently in analytic philosophy – which, profoundly shaped by the empiricist tradition, usually found a world with powers to be deeply troubling news. Many factors contributed to the long exile of powers, but most of them can be traced back to the intellectual climate of the Modern Age –and two factors can be more specifically identified as causes, in different and yet related ways: the first is what I call "the mechanicist world-view", and the second is the empiricist philosophy of David Hume, and its massive influence in modern and contemporary philosophy.

First of all, it might be worth noticing that Modern Age philosophers and physicists slowly but steadily came to embrace the notion of a passive and inherently inert world, devoid of any active power; at best, objects could be characterized dispositionally in terms of inertia and impenetrability, that is to say, by affections that they were passible to be subject to. A paradigmatic example of this attitude would be Descartes' philosophy of physics, according to which extended matter can be merely characterized by geometrical properties of shape and size, and perhaps the passive powers of inertia and impenetrability. The physical world is for him a *plenum*, for he did not distinguish between space and matter; then motion in the physical world is to be treated as the "bumping around" of passively impenetrable objects in the *plenum* –the motion always being relative to other objects, rather than absolute (for there is no absolute space upon which objects are moving). According to Descartes, because of inertia and the conservation of motion, objects will presumably keep bumping into each other indefinitely. In this picture, there is no proper "action", no active power nor original source of motion required, if not – perhaps– the bump that God gave the universe at the very beginning. More generally, the mechanicist world-view required that the only causal sources of movement and change were to be found in the soul of living things and God. An even more radical version of this world-view is Malebranche's occasionalism, according to which only God bears active powers; and God directly intervenes in any apparent instance of causation in the physical world.

> "All natural forces are therefore nothing but the will of God, which is always efficacious. […] He moves all things, and thus produces all effects that we see happening, because He also willed certain laws according to which motion is communicated upon the collision of bodies; and because these laws are efficacious, they act, whereas bodies cannot act. There are therefore no forces, powers, or true causes in the material, sensible world."[4]

The resulting picture of the physical world was indeed similar to a machine, a passive and inert complex of things which has to be externally set in motion by God, and then kept in motion by principles and laws of nature. Descartes, Locke and Newton were not occasionalists like Malebranche was, but the idea of a world as devoid of powers is one, as we will shortly see, that they all took very seriously.

Of course, the story is not as clear-cut as this short reconstruction may lead one to believe. One source of trouble for historians and philosophers alike was the presence of *forces* in Newtonian mechanics; for

[4] Nicolas Malebranche, *The Search After Truth* (1712). Translated and edited by T.M. Lennon and P.J. Olscamp, Cambridge University Press (1997): 448–49.

quite unlike Decartes' mechanicism, Newton's theory required action at a distance between objects – something that presumably required active powers from the objects in order to be performed. The origin and source of gravitational attraction was a source of puzzlement for Newton himself, who for the most part shared the mechanicist world-view of his times. This makes the interpretation of his thought quite problematic. On the one hand, in a letter to Richard Bentley (written between 1692 and February 1693), Newton warned:

> "You sometimes speak of Gravity as essential and inherent to Matter. Pray do not ascribe that Notion to me."

But in other occasions he seemed to be quite happy to assign the source of gravitational attractions to powers of material objects, or particles thereof; e.g., in the Query 31 Appendix to the *Opticks*:

> "Have not the small Particles of Bodies certain Powers, Virtues, or Forces, by which they act at a distance, not only upon the Rays of Light for reflecting, refracting, and inflecting them, but also upon one another for producing a great Part of the Phenomena of Nature? For it's well known, that Bodies act one upon another by the Attractions of Gravity, Magnetism and Electricity; and these Instances shew the Tenor and Course of Nature, and make it not improbable but that there may be more attractive Powers than these."[5]

A similar problem troubles the interpretation of Descartes' physics –for that too was not without its problematic dose of residual "powers", "forces", or "tendencies" (Machamer 2009, Slowik 2017). Similarly, Mcguire (1974: 124ff) provides plenty of examples XVIII century thinkers actively engaging with the idea of a world imbued with active powers. That being said, the mechanicist world-view would eventually command some degree of belief, and prove itself to be a powerful interpretation of reality. According to this world-view, in the words of Burtt,

> "[t]he really important world outside was a world hard, cold, colourless, silent, and dead; a world of quantity, a world of mathematically computable motions in mechanical regularity. The world of qualities as immediately perceived by man became just a curious and quite minor effect of that infinite machine beyond. In Newton the Cartesian metaphysics, ambiguously interpreted and stripped of its distinctive claim for serious philosophical consideration, finally overthrew Aristotelianism and became the predominant world-view of modern times."[6]

This is, to some approximation, the mechanicist world-view. But which are its motivations? Why were Modern Age philosophers and physicists so keen on stripping away the world of its active powers? As introduced before, an active power is, say, water's power to dissolve a sugarcube, while a passive power would be the sugarcube's solubility –its disposition to suffer dissolution. Let's take at face value, for the moment, this distinction between active and passive powers. Many of the "disposed to…" locutions that we normally use (e.g., solubility, malleability, elasticity) refer to dispositions and liabilities that can be more naturally taken to be passive powers –viz., something's capacity to suffer some change at the hands of something else. On the contrary, active powers are not as easily named; e.g., there is no easy one-word expression such as "solubility" to refer to the correspondent active power of the water to

[5] For more on these matters, see Henry (1994). Also see Ellis (2001: 263ff), who points out the further problem of how could the exercise of such powers affect other objects through a *vacuum*, without the mediation of anything else; Newton discusses this problem in the very letter to Bentley quoted before.

[6] Burtt (1932: 237), as mentioned in Ellis (2001: 107ff).

dissolve the sugarcube. Perhaps it is because the change in the sugarcube tends to be more noticeable than any contribution the water is making to the process, that we focus on the properties of the sugarcube: more often than not, we only recognize and name passive powers of inanimate objects, and it is only through some degree of intellectual effort that we recognize the active ones as well. However, active powers are extremely easy to notice in the case of what Aristotle called "rational powers", that is to say, the active powers of a soul- or mind-equipped living thing, e.g., my power to go the cinema instead of going to the dentist. Unlike the active powers of inanimate matter, the exercise of rational powers is the product of will and choice –someone possessing rational powers can be said to be a rational agent. Nonetheless, not all active powers are rational powers (Harré and Madden 1975: 88-89), and the "threats and promises" brought by powers are only that in a metaphorical sense. To be fair, the doubt has always lingered, even in more recent times, that a world with (active) powers was an excessively anthropomorphized world; according to David Armstrong (in Armstrong, Martin and Place 1996: 93):

> "Death lurks within the poison, while inanimate desirable things solicit being used. Such anthropomorphism may even have biological value. What more natural, then, when we turn to the metaphysics of dispositionality, than to project into the disposed things a ghostly image of the manifestation of the disposition, even when it is not manifested?"

Similarly, Russell (1912: 11) dismissed the idea of "causes" actively operating to produce "effects" to be an unwarranted generalization of our experiences as active causal agents:

> "The mistake […] consists in the supposition that causes 'operate' at all. A volition 'operates' when what it wills takes place; but nothing can operate except a volition. The belief that causes 'operate' results from assimilating them, consciously or unconsciously, to volitions."

That being said, however, there is no reason to assume that active powers cannot be found in inanimate objects, viz., objects without a rational mind or a soul. The case of the sugarcube's dissolution in water is a good example of a causal process in which it is *prima facie* quite easy to identify an agent and a patient, and in which no mind or soul is involved. Yet this seems to be forgotten on the supporters of the mechanicist world-view, who ultimately claim that the physical world is devoid of active powers because many instances of motion and change in the physical world are not willed by anyone. Their background assumption appears to be, quite circularly, that active powers are only the rational ones. Consider what Leonhard Euler wrote, in one of his *Letters to a German Princess* called "Origin and Nature of Powers":

> "Though it cannot be denied that the souls of men and of beasts have the power of producing changes in their bodies, it would be absurd to maintain that the motion of a ball on the billiard table was retarded and destroyed by some spirit, or that gravity was produced by a spirit continually pressing bodies downward, and that the heavenly bodies, which, in their motion, change both direction and velocity were subjected to the action of spirits, according to the system of certain ancient philosophers, who assigned to each of the heavenly bodies a spirit, or angel, who directed its course."[7]

[7] Originally translated in 1795 by Henry Hunter from the French version (*Lettres à une princesse d'Allemagne*), but significantly revised in Watkins (2009).

This train of thought sometimes took a religious turn; it was argued that to populate the world of active powers, as Aristotle and the Scholastics did, was tantamount to "metaphysical paganism" –and thus, quite pernicious on religious grounds. For example Malebranche, discussing what he called the "errors of the ancients" claimed that there is something surely divine in the idea of an active power, a capability for change; and therefore

> "we admit something divine in all the bodies around us when we posit forms, faculties, qualities, virtues, or real beings capable of producing certain effects through the forces of their nature; and thus we insensibly adopt the opinion of the pagans because of our respect for their philosophy."[8]

More generally, supporters of the mechanicist world-view seemed to oppose the notion of an intrinsically active world on the assumption that would lead to a multiplication of rational powers –and mysterious bearers thereof. A variant of this idea, as expressed in Burtt (1932: 133), was that of a *spirit of nature*,

> "which holds the different parts of the material universe together in a unitary system which is distinctly not mechanical. […] The idea was quite common throughout the later Middle Ages, being appealed to frequently by mystics, theosophists and speculative natural philosophers; in Kepler, for example, we find each planet, including the earth, endowed with a soul, whose constant powers are shown in the planetary whirlings."

A further example, as detailed in Henry (1994), is constituted by the troubles Newton encountered in finding a source of gravity in a fully mechanical world; which has led some interpreters to suppose that such a source was to be found in immaterial spirits, or perhaps God himself –a point on which Newton was often quite elusive.

In the XIX and XX centuries the transformation of (active) powers in an unscientific and "metaphysical" residue –back from a time where the world was governed by spirits and angels– was finally complete. This is a depiction of powers that has indirectly shaped the theories of many philosophers of science, and even metaphysicians, throughout the XX century; and it is a very familiar depiction, as well, for many of us today. Yet the collapse of active powers onto rational powers, and the related collapse of causal agents onto rational agents, calls for discussion. For one, Aristotle clearly believed inanimate matter to possess active powers –so how did the mechanicists got to the contrary opinion? According to Freddoso (2002), the stripping away of powers from the material world has a theological source in the Middle Ages; for according to him, many supporters of the mechanicist world-view, and more generally, what we would now call "the empiricists", were

> "following the lead of those medieval Islamic and Christian occasionalists who had perceived a 'heathen' threat to God's sovereignty over nature, as well as a spiritual danger for believers, in the Aristotelian attribution of causal powers and actions to natural material substances."[9]

Perhaps the most spectacular example of this proto-occasionalist current would be al-Ghazālī's rejection of necessary connections in nature (which predates Hume by some half a millennium), based

[8] Nicholas Malebranche, *Eclaircissements sur la recherche de la vérité*, edited and translated by T.M. Lennon and P.J. Oscamp, Cambridge University Press (1997): 446ff.

[9] Introduction to the translation of Suarez' *On Creation, Conservation, and Concurrence: Metaphysical Disputations 20-22* (South Bend, IN: St. Augustine's Press, 2002), pp. *li.*

not on empiricist assumptions, but on the idea that it would be unacceptable to have a connection in nature so modally strong that God himself could not have broken it.[10]

There is, of course, much more to say about "empiricism". Yet, for XX century philosophers, the name most usually associated to the ban of powers and necessary connections in nature, is that of British empiricist David Hume: whichever his philosophical roots might have been, his influence on this topic has been nothing short of titanic. Paradigmatically: "[o]f all the ideas that occur in metaphysics, none are more obscure and uncertain than those of *power*, *force*, *energy* or *necessary connection*" (from *An Enquiry Concerning Human Understanding,* Section 7, Part I). Hume goes on to elaborate:

> "[w]hen we look around us at external objects, and think about the operation of causes, we are *never* able to discover any power or necessary connection, any quality that ties the effect to the cause and *makes it an infallible consequence of* it. All we find is that the one event *does in fact follow* the other. The impact of one billiard-ball is accompanied by motion in the other. This is all that appears to the outer senses. The mind feels no sentiment or inward impression from this sequence of events: so in no single particular instance of cause and effect is there anything that can suggest the idea of power or necessary connection."[11]

These brief quotes, and the account they express, are some of the most important in the history of philosophy; for the empiricist account of causation and powers would go on to mold philosophy of science and metaphysics for centuries. Hume's criticism of powers is more general and radical than those put forward by supporters of the mechanicist world-view. I call it "more radical" for a simple reason; the mechanicist world-view was trying to expunge active powers from the material world –viz., it was trying to move away all active sources of motion and change from physical reality to some other realm, or perhaps just limiting it to living things. But in the philosophy of David Hume, the very notions of *power* and *causal agency* are put under scrutiny –and eventually they are found wanting from an epistemic point of view. Nonetheless, clearly Hume was influenced by those who came before him and his positions can be taken to constitute the natural, albeit more radical, resolution of the mechanicist world-view. Proper powers –and genuine causation– are now not only limited to living things, souls, immaterial spirits and God. They are nowhere to be found.[12] Freddoso (ibid.) again,

> "[according to the occasionalists] God and (perhaps) other spirits are genuine agents exercising genuine causal powers, but they are the only such agents and their powers are the only such powers. In contrast, our ordinary and ubiquitous attributions of power and action to material substances are strictly speaking false; whatever truth they might embody is best captured, according to the occasionalists, by a reductive analysis that replaces notions such as causal efficacy, action, causal power, and causal tendency with metaphysically tamer notions such as constant conjunction or counterfactual dependence, which do not presuppose agency on the part of material substances. […] Their complaint is not with the notions of agency or power as such, but rather with the deleterious theological consequences of ascribing agency and power to putative natural 'causes'. In the hands of Hume, however, the occasionalist critique of

[10] For more on this fascinating topic, see Nadler (1996) and Richardson (2015).

[11] These passages from the Beauchamp (1999) edition of the text.

[12] There are those, e.g., Strawson (1989), maintaining that Hume did not expunge powers and necessary connections from the physical world; allegedly he only held the weaker claim that, if there are, we do not have epistemic access to them, and thus cannot positively describe them. Occasionally Strawson reinforces this interpretation by claiming that Hume in fact accepted the existence of inaccessible causal powers, and hidden necessary relations. I am in no position to further delve into this dispute –but, as far as I understand, this interpretation of Hume is considered to be quite controversial and problematic.

> Aristotelianism is absorbed into a general assault on 'metaphysical' notions that have an 'insufficient basis' in sensory experience. By Hume's lights the whole gamut of concepts that enter into an Aristotelian account of efficient causality fail to pass epistemic muster, regardless of what the humanly inaccessible truth about the "secret powers" of things might be."

Late modern and early contemporary philosophy of causation and powers stems more or less directly from this picture. A perfect manifesto here would be the well-known passage from Russell (1912) according to which causation –and, one can presume, powers as well– "is a relic of a bygone age, surviving, like the monarchy, only because it is erroneously supposed to do no harm." Yet, in the early XX century this attitude towards powers presented itself, as soon as in Carnap (1936/37) as an issue of meaning and truth of dispositional sentences such as "this sugarcube is soluble". This is where, as hinted by Freddoso, we first meet the *conditional analysis of dispositions*, viz., a reductive semantics of dispositional ascriptions according to which something has a disposition to M in situation S if and only if it would M if S. Ryle's (1949) ticket-to-inference view and Carnap's (1936/1937) reduction sentences view both belong in this family. This family of views semantically deflates dispositional ascription in natural language so as to make them acceptable for an empiricist-minded philosopher.
However, the last nail in the coffin of powers was the rise of "neo-Humean metaphysics", that is to say, a positive metaphysical stance based on Hume's rejection of necessary connections –a bold and perhaps metaphysically naïve move that Hume himself probably wouldn't have dared to perform. Neo-Humean metaphysics is perfectly encapsulated by the positions of David Lewis, perhaps one of the last to present a grand systematic metaphysical system in contemporary philosophy; we owe to him the principle called "Humean Supervenience", according to which (Lewis 1986a: ix-x):

> "all there is to the world is a vast mosaic of local matters of particular fact, just one little thing and then another. […] We have geometry: a system of external relations of spatiotemporal distance between points. Maybe points of spacetime itself, maybe point sized bits of matter or aether or fields, maybe both. And at those points we have local qualities: perfectly natural intrinsic properties which need nothing bigger than a point at which to be instantiated. For short: we have an arrangement of qualities. And that is all. There is no difference without difference in the arrangement of qualities. All else supervenes on that."

Thus, every alleged law of nature and every alleged power is accounted for in terms of this primitive distribution of properties. It is a contingent distribution as well: thus in the neo-Humean world there is no resilient "natural order", no necessary nomic structure, no modally strong tendencies or capacities of objects to bring forth certain behaviors rather than others. Another consequence of the denial of necessary connections between distinct existence is that

> "anything can coexist with anything else, at least provided they occupy distinct spatiotemporal positions. Likewise, anything can fail to coexist with anything else. Thus if there could be a dragon, and there could be a unicorn, but there couldn't be a dragon and a unicorn side by side, that would be an unacceptable gap in logical space, a failure of plenitude."

This is what Lewis (1986b: 88) calls "the Principle of Recombination" –which functions as laid-back construction rule for possible worlds –viz., different ways for the world to be. Here is the briefest sketch of Lewis' systematic metaphysics, regarding the status of powers. The global distribution of properties of each world is sufficient, given some systematization, to account for laws of nature (of that world). Laws of nature help in defining an ordering of comparative similarity between worlds, which is

needed to account for counterfactual conditionals. Counterfactuals, in turn, are used to treat causation. Finally, counterfactuals and causation, together, account for powers. There are is a multiplicity of interconnected notions needed for this system to function properly (e.g., possible world, similarity, duplicate, natural property, etc…); and this brief sketch does not allow the reader to appreciate all the virtues and quirks of Lewis' metaphysics. For now, what is important is that, at the bottom, there is no modality and no powers: all that there is, is the mosaic –namely, "one little thing after another". I will come back to neo-Humean metaphysics and its tenets multiple times throughout this thesis.
Philosophers of Humean or neo-Humean sympathies, in general, have no troubles in finding reasons to be suspicious of powers. First of all, it was claimed that, being analytically connected to their alleged effect, powers could not be causes of them. For example, Mackie (1977: 366-367) writes that:

> "[i]ntrinsic powers or specifically dispositional properties in the rationalist sense would violate the principle that there can be no logical connections between distinct existences […]. For a piece of glass's being fragile would on this view be an intrinsic feature of the glass, and the conjunction of this with the glass's being (suitably) struck would be a distinct existence from the glass's breaking".

And similarly, according to Block (1989: 157):

> "the fact that dormitivity is sufficient for sleep is perfectly intelligible in terms of this logical relation. What reason is there to suppose that there must *also* be a nomological relation between dormitivity and sleep?".

Relatedly, it was also usually claimed that powers can only produce trivial causal explanations, which could be easily substituted by a more interesting kind of explanation that does not mention powers – but perhaps some kind of microstructure or underlying mechanism. This attitude is perfectly encapsulated by a well-known –at this point, quite clichéd– passage in Molière's *Le Malade Immaginaire* (as translated and discussed in Hutchinson 1991):

> "I am asked by the learned doctor for the cause and reason that opium makes one sleep. To this I reply that there is a dormitive virtue in it, whose nature it is to make the senses drowsy."

The argument being here that the question "why does opium make one sleep?" cannot but receive a pointless and uninformative answer in "because it has the power to make one sleep"; this is usually taken to be a point about causal explanation, and the non-suitability of powers to figure in any such explanation. A better explanation would presumably mention a number of opioids' chemical features and structure as narcotics. Similarly, a glass bottle's shattering would be better explained in terms of its crystalline microstructure, rather than by its fragility –that is to say, by its disposition to shatter.
This is where we first meet the idea of powers having a "base"; standardly, the base of a power is one or more properties of its bearer (or properties and relations of parts thereof), which causally explain its manifestation. This definition does not exclude that a power might be its own base (if powers are indeed causally responsible for their manifestations), nor that, even if it is not, the base is not in turn another power. However, for some time the idea of powers having a base was associated with their having a distinct non-dispositional base; this base would not only causally explain the power's

manifestation, but also metaphysically account for the possession of the power itself.[13] This idea is as old as the mechanicist world-view; e.g., Robert Boyle (a very early example in the history of the scientific method) states that:

> "the solidity, taste, etc, of salt may be fairly accounted for by the stiffness, sharpness, and other mechanical affections, of the minute particles whereof salt consists."[14]

In the XX century, the existence of distinct non-dispositional bases constituted somewhat of an orthodoxy (for an overview on this matter, see Mumford 1998: 11ff). E.g., according to Quine (1973: 10) dispositional terms are merely "placeholders" that we utilize to pick some hitherto unknown microstructural state of mechanism before further scientific investigation finally unveils it. He writes:

> "A name for a specific disposition, e.g. solubility in water, deserves its place in the vocabulary of scientific theory as a name of a particular state of mechanism. In some cases, as in the case nowadays of solubility in water, we understand the physical details and are able to set them forth explicitly in terms of the arrangement and interaction of small bodies. Such formulation, once achieved, can thenceforward even take the place of the old disposition term, or stand as its new definition."

Quite naturally, according to those buying into a neo-Humean metaphysics (or, more generally, into an empiricist-minded ontology), we will not find powers at the bottom, viz. in the ultimate microstructural bases or mechanisms that are responsible for the manifestations of powers. Throughout all the twists and turns of history, the mechanicist world-view is vindicated in contemporary metaphysics.

2.3 Powers strike back

One could think that this veritable barrage of arguments, traditions and slogans constitutes nothing short of a tomb for powers. For some time, that was the case: powers had indeed been unwelcomed entities in the philosophy room. However, things have started to change. Since the '70s of the XX century, there has been a revived interest in powers, first in philosophy of science and metaphysics, then in other areas of philosophy. The idea was, simply put, to take seriously the familiar picture of reality sketched in the introduction, in which material objects and living things alike are imbued with powers, capacities, and dispositions. Quite naturally, this coincided with a reprisal of Aristotelian themes about powers and causation in general, which makes this new "realism about powers", an instance of the burgeoning "neo-Aristotelian" literature in contemporary metaphysics (I admit I abused quotation marks to excuse myself from the responsibility of defining such broad and vague categories. But I will come back to it). There are several reasons for this shift in attitude towards powers. Some of them concern the troubles encountered by empiricists foes of powers, both in the conditional analysis of dispositions, and in the quest for distinct non-dispositional bases for all powers. On the other hand, powers can be shown, once accepted in one's ontology, to be philosophically very useful items, which might indirectly count as an argument in their favor once a cost-benefit methodology is deployed. Let us see these points in turn.

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[13] This curious "double job" of bases of dispositions, one causal (of the power's manifestation) and one inherently metaphysical (a proper grounding of the power) has not always been properly disentangled, and the two readings have often being conflated. One to clearly distinguish between them is Bauer (2011: 82-83).

[14] Robert Boyle, *About the Excellency and Grounds of the Mechanical Hypothesis* (1647), in M.A. Stewart (ed.), Selected Philosophical Papers of Robert Boyle (1979: 149).

First of all, the project of treating dispositions by exploiting their link with conditionals was plagued with difficulties since the very beginning. Carnap was quick to realize that a material conditional, with its well-known issues (viz., *ex falso quodlibet* and *verum ex quodlibet*) would not do the job, but it was not easy to properly formulate a semantics for conditionals that would work. Most importantly, intensional conditionals were out of the questions for Carnap. Yet even with the help of Stalnaker (1968) and Lewis (1973) possible world semantics –which takes subjunctive conditionals to be variably weak conditionals, various counterexamples commonly known as interferences are bound to pop up in great number, viz., situations in which the object is disposed to M if S, but would not do it –or vice versa. Although such problems were allegedly known since the late '50s, the paternity of these counterexamples was respected of Charles Martin, who only published a paper on the subject in 1994. Since then, more refined analyses have been presented, drawing from various features of the counterexamples, involving other devices such as laws of nature, causation, intrinsic properties, and many more. Many important lessons on the nature of powers are to be learnt from this debate, and the literature, at this point, is huge.[15] That the project was possibly a failure was already envisioned by Goodman (1954: 39), as he writes:

> "I suspect that the problem of dispositions is really simpler than the problem of counterfactuals. This may sound strange, in view of the apparent full convertibility between dispositional and counterfactual statements; but it turns out that ordinary dispositional statements often correspond to abnormally weak counterfactuals."

Although supporters of some version of the conditional analysis are still to be found (see the previous footnote for references), many are now convinced that no reductive analysis of powers in modal/conditional terms is forthcoming –they are claiming to discern a pattern according to which interference-based counterexamples can be generated indefinitely, no matter the account. What to infer from this (potential) failure is unclear; however, someone is willing to take a very radical route, and take dispositionality to be an unanalyzable primitive. According to Mumford and Anjum (2011: 193),

> "[i]f we accept the *sui generis* nature of the dispositional modality, therefore, we can draw a close to the Sisyphean task of endlessly producing new candidate analyses, only to see them fail and then starting all over again. Enough ink has been spilled on this doomed project already."

However, one must keep in mind that there are many foes of powers who wouldn't be moved by the (possible) failure of the conditional analysis; their belief in a world without powers would still be defended by the possibility of finding distinct non-dispositional bases for every presumed power –viz., by that hope that ultimately there will be a microstructural explanation for everything dispositional about this world. Quine (1973: 10) was clearly of this advice; he clearly perceived Carnap's problems of finding an extensional semantics for dispositional ascriptions. Like Carnap, Quine was a die-hard extensionalist, and thought that dispositions couldn't be treated with intensional conditionals. Again,

[15] The starting point are Martin (1994) and Bird (1998). The first 'refined' conditional analysis is Lewis (1997). The contributions, as of now, are endless. For an up-to-date bibliography, the reader might want to consult some of the most recent attempts, as in Choi (2008, 2009), Manley and Wasserman (2008, 2011), and Contessa (2013). Choi (2006, 2008) is perhaps the only one to defend the simple, unrefined conditional analysis presented above in the text. Lowe (2011) offers some illuminating insight on this matter. Vetter (2015), building on Manley and Wasserman (2011), criticizes the conditional analysis of dispositions from a slightly different angle.

for him dispositional terms are placeholders that will be removed as the microstructural enquiry proceeds. Thus, he would agree with his fellow extensionalist Nelson Goodman that dispositions are not as problematic as (counterfactual) conditionals. Earlier on (Quine 1960: 204) he wrote:

> "Dispositions are, we see, a better-behaved lot than the general run of subjunctive conditionals; and the reason is that they are conceived as built-in, enduring structural traits."

Unfortunately for these foes of powers, however, the hope of eventually finding non-dispositional distinct bases for each disposition seems to have vanished as scientific enquiry progressed. Fundamentally there appears to be powers.[16] Furthermore, we seemed to have reached a point in which no further internal structure of subatomic particles can be unveiled; whichever powers there appears to be there –they cannot be explained away in this fashion.

This is the so called "Argument from Science", so dubbed in Ellis and Lierse (1994: 33), according to which "with few exceptions, the most fundamental properties that we know about are all dispositional" (the argument is however older than 1994, and can traced back as far as Broad's *The Mind and Its Place in Nature*, 1925). In general, the Argument from Science argues that if it can be scientifically *a posteriori* shown that fundamentally there are powers (and that seems to be the case), then Humean Supervenience, and perhaps all neo-Humean metaphysics, turns out to be false. As claimed in Mumford (2006: 471): "the whole debate between Humean and anti-Humean metaphysics might rest on this viability of the argument".[17] More generally, the Argument from Science constitutes, for many, a red flag that something is deeply wrong with neo-Humean metaphysics. Neo-Humean metaphysics is the last philosophical appendix of the mechanicist world-view developed throughout the Modern Age, but one that, after the demise of Newtonian mechanics, rests on questionable grounds. Rudely put, for many friends of powers, neo-Humean metaphysics is old science turned metaphysics –that is to say, the worst kind of metaphysics. Ellis (2001: 109) can be taken as somewhat of a manifesto of this attitude:

> "The real world is essentially active and interactive. It is not passive, as the old mechanists and the neo-mechanists of today believe. It is dynamic. […] Scientists today certainly talk about inanimate things as though they believed they had such powers. Negatively charged particles have the power to attract positively charged ones. Electrostatic fields have the power to modify spectral lines. Sulfuric acid has the power to dissolve copper. The question we have to consider in this chapter is: What is the source of these powers? The old mechanist view was that things do not themselves have causal powers. The powers lie outside them. They are contained in the forces that act externally on things to change their states of motion or aggregation.
>
> Caroline Lierse and I think that this is fundamentally wrong. Things do have causal powers, we say, and these powers are among the properties that things, at the deepest levels of existence, have essentially, without which they would not be the things they are."

In short, a world with powers is really, as suggested in the first section, closer to the world as depicted by contemporary science. Again, the aim of this thesis is not to defend the claim that this is a world with powers, instead of a world without powers; thus, supporting the Argument from Science against

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[16] At least, as fundamentally as we can get. I will ignore this complication for the time being. In Chapter 3 I will explain that friends of this "fundamentality-based" conception of power realism do not (or should not) assume grounding to be well-founded.

[17] See Molnar (2003) for some background on the science between the Argument from Science, also Williams (2011a) for detailed (and more recent) discussion.

neo-Humean metaphysics is not in my current interest. Additionally, to fully weight and evaluate this alleged "scientific view of the world", would require extensive competency in both physics and metaphysics –and I, for one, lack it in at least one of the two.

The Argument from Science is not uncontroversially accepted; Molnar (2003: 132-133) argues that it does not take into consideration the fact that not all explanation and grounding of powers need to be microstructural, and Williams (2011a) similarly claims that it "neglect[s] important ways that dispositions could be grounded by [non-dispositional] properties"; a number of such options are sometimes characterized by saying that such fundamental powers can be "ultra-grounded" in an holistic or otherwise non-microstructural fashion, albeit what the term "ultra-grounding" means, is usually left unsaid.[18]

There's also another danger in the Argument from Science, one that stems from reading one's ontology straightforwardly from language, viz. through the overabundance of implicitly dispositional talk in microphysics. It is true that many features and characteristics of subatomic particles appear to be described dispositionally –in terms of the behavior that they can elicit in a given circumstance. And it is also true that in many cases there is no other way to go about describing them, since many particles are structureless. Yet, it is unclear to me which philosophical lesson one should extract from this fact – which, as it is, appears to be a matter of language rather than reality. There is, of course, an epistemic element in this proliferation of dispositional terms; e.g. Foster (1982) and Heil (2010) claim that the lack of positive examples of non-dispositional properties possessed by these allegedly structureless, partless, and perhaps even unextended, entities is nothing but a methodological limitation of science; because such items are impervious to most kind of direct observations, they can only be properly described, so to speak, through what they do. The consequences of this point are rather obscure, but at least it seems to give a "metaphysically innocent" reason as to why the lexicon to describe such entities with is entirely dispositional. Our epistemic access to properties and features of the outside world (direct or indirect as it might be) is *still* mediated by the way in which we causally interact with them – thus, the abundance and variety of dispositional vocabulary shouldn't really be that surprising. Williams (2011a: 79) wrote that

> "[t]he nature of scientific practice in microphysics leaves us unable to say (with any confidence) what the intrinsic natures of the properties of the fundamental entities are really like. Because the dispositional characterisation applied to the fundamental entities is an inescapable consequence of the methodology, that the characterisation is exclusively dispositional provides no evidence that the fundamental properties are exclusively dispositional—even if that happens to be the case."

Summarizing, if some characteristics or features of subatomic particles are described dispositionally, this is still not sufficient to claim that they are really dispositional in character –that those dispositional expressions really refer to powers. The reader might at this point wonder what it would take to settle this matter –viz., how to give necessary and sufficient conditions for something being a power. What counts as a power, exactly? Relatedly, what exactly are the applicability conditions of such dispositional predicates, if they can be satisfied whether or not the object in question has a "genuine" power? To such issues, I will come back extensively in the course of this thesis.

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[18] Harré (1986: 295), Psillos (2006: 154). Recently, Bauer (2011) has argued that *mass* (a paradigmatic case of intrinsic fundamental power) is extrinsically grounded in the Higgs field; the point to bring home is, according to him, that in our search for the grounds of powers we should not fixate on grounding through microstructural parts or particles of the power's bearer.

All in all, the jury on the Argument from Science is still out –yet, in my opinion, its formulation was a significant step forward in the debate, insofar as it questioned the arguably blind assumption of those, like Quine, who simply hoped, or expected, that eventually every power would be assigned a distinct non-dispositional base. To be sure, powers having distinct bases is not *per se* a far-fetched idea; indeed, this seems to be the case for most powers we encounter in the macroscopic world of our everyday lives. E.g., what is doing the job in the shattering of a glass bottle is not really its 'fragility' but its crystalline microstructure; yet it is unclear if the same move is available for *all* powers; furthermore, it is unclear whether such a base (e.g., the crystalline microstructure) will in turn be devoid of powers (Ellis and Lierse 1994: 31-32). The Argument from Science, roughly put, opened the match between friends and foes of powers.

Finally, the reasons behind this resurgence of power ontology, once the conditional analysis and neo-Humean metaphysics were shown to be debatable and controversial stances, are to be found within philosophy –rather than science. Powers, once accepted in one's theory, are able to pull some serious weight, in philosophy of science, semantics, and metaphysics. The most immediate application concerns modality and conditionals, as first noted by Mondadori and Morton (1976); and even before that, this was already noted by both Quine and Goodman when they admitted that "the problem of disposition is really easier than the problem of conditionals"; still, they would not accept dispositions in their inventory of the world. Many would nowadays take the Lewis-Stalnaker semantics to have solved the "problem of counterfactual conditionals" that plagued Chisholm (1946) and Goodman (1947) in their semantics of dispositional ascriptions. Still, for those suspicious of the possible world ontology required by the semantics, or for those who want an ontology that more resembles the familiar worldview sketched in the beginning of the Chapter, the road is now open for a power-based semantics of conditionals, as in Jacobs (2010). The idea is quite simple: take the correlation between dispositions and conditionals to provide an account of counterfactuals rather than dispositions. Alternatively, dispositions can define possibility (Martin and Heil 1999, Mumford 2004, Borghini and Williams 2008, Vetter 2015). That dispositions can explain, ground, or otherwise account for a number of modalities – and that they can do it in a way that is much preferable to the options provided by neo-Humean metaphysics–, has been programmatically announced multiple times, although extensive accounts are still scarce at this point. E.g., Martin and Heil (1999: 49-50), Ellis (2001: 245), Molnar (2003: 223), Mumford (2004: 168-170). Outside of modality, dispositions can be used to account for causation (paradigmatically, Mumford and Anjum 2011), the nature of properties (as first noted in Shoemaker 1980), and laws of nature (Bird 2007a). Relatedly, talk of powers was independently deployed by many philosophers of science wondering what the content of natural laws could be in highly idealized contexts (viz., *ceteris paribus* laws); e.g. Cartwright (1989, 1999, 2002), Hüttemann (1998), Lipton (1999), and Kistler (2003).[19]

[19] More recently, Bird (2016) has distinguished between applications of powers that belong to a "fairly abstract and general level of metaphysics", as those revolving around laws of nature and the nature of properties, and those revolving around the study of "macro-phenomena" of philosophical interest, such as intentionality, morality, and free will. Quite interestingly, Bird puts causality in the latter category. There's two (related) reasons for this choice; firstly, the causality so often analyzed by power theorists is not the causality between subatomic particles, but that between tables and rocks, viz. macroscopic ordinary objects (e.g. Mumford and Anjum 2011); secondly, one may more generally argue that causality cannot be found at the most fundamental level, if there is such a thing; causation is, if anything, a far more superficial and localized phenomenon (e.g., not all laws of nature are causal). In Chapter 2, I will say more on all such topics: the status of macroscopic objects, their properties and relations, and the fundamentality of causation.

This is of course no direct argument for the existence of powers; yet, once a cost-benefit methodology is deployed, the case for powers becomes more inviting. The range of applications is indeed quite stunning –*if* one is willing to accept powers in their ontology. But *what if* one accept powers in their ontology? This is what I now turn to discuss.

3. Three goals

Here is what I am going to do, and what I am *not* going to do in this thesis. I am not going to (directly) argue for the existence of powers, for a world with powers in contrast with neo-Humean metaphysics. I am not going to argue for nor against the conditional analysis of dispositional ascriptions, or the link between dispositions and conditionals. I am not going to pursue any of the explanatory work previously suggested –a dispositional account of modality, causation, laws of nature of any kind. Rather, I am going to investigate the stance of those who accept powers in their ontology, what I will call "power realists", who reject the idea of a powerless world. Thus, I am primarily going to consider and discuss options in the realist camp, and discuss antirealist options merely for purposes of contrast and comparison.

What is the problem, if any, of realism about powers? If I had to pick a word to describe the difficulty, I would say that realism about powers is *unclear*. I take there to be several obscurities in the claims usually put forward by power realists, in all of their variants. This lack of clarity is the real antagonist in this thesis –and its dispelling is its main goal. In this section, I will introduce three different (and yet related) ways in which power realism is obscure in its current formulations. This will suggests three goals for the whole thesis.

3.1 The Question of Realism for Powers

The first source of obscurity revolves around very general features of the debate between the power realists (or realists, for brevity[20]), and their antirealists adversaries. The observant reader will have noticed a number of not-so-subtle shifts in the debate in the course of the previous section. For the discussion started as between supporters of a world with powers, and supporters of a world without powers. It thus seemed that the disagreement between realists and their foes was an ontological disagreement –viz., a disagreement about the existence of powers. According to the realists but not the antirealists, God was indeed adding something when he added powers to an otherwise passive, static and inert world.

At some point, however, the discussion switched to whether there fundamentally are powers –whether neo-Humean metaphysics is right, or there are base-less dispositions that cannot be grounded or explained away in a microstructural fashion. This is apparently a different kind of disagreement, since it would appear that everyone, even neo-Humean antirealists about powers, admit that powers exist; they just deny that they are fundamental, or a "genuine addition" to the world; furthermore, these two approaches are seemingly not compatible –since an antirealist, in this second sense (a neo-Humean who admits non-fundamental powers), is clearly a realist in the first sense (since she admits powers). A related intuition that I heard more than once was that, because there indubitably are true dispositional ascriptions (this sugarcube *is* soluble, after all) –in some way everyone agrees that there are powers; disagreement rather lies in the background metaphysics. Yet one often struggles to find a precise

[20] I will occasionally use just the term "realism" and "realists" to refer to realism about powers and realists about powers, and the same for their antirealists adversaries. I hope the context is sufficient to make the intended meaning clear.

articulation of this intuition, and an elaboration of its consequence (Bird 2016, as we will see, constitutes a rare exception). Conversely, those working with a more substantial notion of power in mind have found disingenuous the claim neo-Humeans accept the existence of powers, albeit in a non-fundamental fashion.

There's more to that, however: at some point, the discussion has switched to whether some properties, those that we refer to with ineliminably dispositional predicates in our best scientific languages, are dispositional in character; thus, there seems to be some disagreement about the nature or internal make-up of properties. For example, a very famous variant of power realism is the so-called "dispositional essentialism" (e.g., Ellis 2001, Bird 2007a) according to which at least some properties (perhaps the more natural or fundamental ones), are essentially dispositional.

Finally, throughout the last decades of the XX century, a good portion of the debate between friends and foes of powers has revolved around the viability of the conditional analysis –or some closely-related enterprises. Martin (1994: 7), in his seminal work on the conditional analysis and its problems, wrote that:

> "[i]f, as we have seen, counterfactuality or strong conditionality cannot explain dispositions, then there is no place to turn but to actual first-order dispositions or powers. How could anything else be made to order by nature to do the job?"

It would seem that the success or failure of the conditional analysis is an important factor to consider. Thus, the question of realism for powers can also be formulated as a semantic issue about sentences with dispositional ascriptions –and, more generally, about the viability of reductive semantics such as the one provided through the conditional analysis (or other closely related analyses).

In conclusion, there are several ways to understand the question of realism for powers. We can understand the debate between friends and foes of powers as a debate over the existence of powers, or over their fundamentality, or over the nature of properties; Finally, it can be taken to be a semantic dispute over the semantics of dispositional ascription, or over the viability of (some version of) the conditional analysis. All of these characterizations have been used in recent literature, but they are in no way equivalent, and in fact, some of them are mutually incompatible. Overall, the first goal of this thesis is to clarify what the bone of contention really is, in the debate between realists and antirealists about powers; which one of those formulations is preferable –why– and which are the relations between them.

Additionally, one must keep in mind that the contrast between the question of realism for powers as being about what there *really* or *fundamentally* is, as opposed to what merely is, or exists, mirrors recent development in metaphysics and metaontology, more specifically, the rise of grounding as a crucial tool for metaphysical enquiry (paradigmatically, as in Schaffer 2009). Indeed, the grounding of powers by non-dispositional properties (or, as they are sometimes called, "categorical" properties), constitutes a classical application of grounding. Grounding, metaphysical explanation, and other "metaphilosophical" notions will be important players in what is to come; I will introduce them in detail in the next Chapter.

Before moving on, this is a good time to address a possible source of confusion. For in this, and several other passages, this thesis might seem to oscillate between a work of *descriptive* and a work of *prescriptive* metaphysics. In this specific case, which relates to the metaontology of the debate between realists and antirealists about powers, it might be unclear whether my goal is to clarify what the bone of the contention is –as it is in the literature–, or what the bone of contention should be. All things considered, this is not an exegetical work. I have no interest, *per se*, in the reconstruction of the debate. I

am rather interested in the formulation a clear and coherent dialectic between friends and foes of powers, a more rigorous terrain of engagement. This work is intended to lean, in this sense, on the prescriptive side of metaphysics.

3.2 The Quest for Dispositionality

There is a second, and perhaps even deeper trouble for power realists. Let us agree with them that there are powers –or perhaps that there are "irreducible" or "fundamental" dispositions, or perhaps that there are properties with an inherently dispositional character or nature. What does this character amount to? What counts as a power –viz., how to give a positive and informative characterization of *dispositionality*, that is to say, being a power?

Powers are indeed –as in Molnar (2003: 186)– the cornerstone of a new metaphysics. As the previous section illustrates, it is not a single argument, position or systematic ontology that has rehabilitated powers; rather the hope of this "power project" lies in the explanatory work that powers can do in the relevant areas of philosophy; yet there is no shared understanding on *what* these powers are, and *how* are they going to perform such explanatory work.

During the first years of this renewed interest in powers, a small surge of interest revolved around the notion of the "mark of the dispositional". This is a term that I will employ, with the following meaning: the mark of the dispositional is (a set of) necessary and sufficient conditions for something being a power. Back in the days in which the conditional analysis was the orthodoxy, the mark of dispositional was taken to be *conditional entailment*; a disposition entails a subjunctive conditional (presumably the one it is analyzed with), whereas a non-dispositional property does not. A small but intense debate was sparkled after Mellor (1974) made the legitimate point that, given certain assumptions, almost all features and characteristics, even the most paradigmatically "non-dispositional", such as shape and size, entail some kind of conditional (for a reply to Mellor, see Prior 1982); some, like Mellor, took this as proof that all properties are dispositional in character. More recently, it was argued (Mumford 1998: 78ff) that only dispositions entail conditionals with some modal strength; but the idea of taking conditional entailment as the mark of the dispositional lost traction as the conditional analysis went more and more under scrutiny –and the *prima facie* link between dispositions and conditionals was discovered to be messier than originally thought. One of the few, in more recent times, to tackle this problem head-on is Molnar (2003: 57ff), who introduces a number of different "marks of dispositionality"; most of them can only work as necessary but not sufficient conditions, since they are not peculiar to powers (intrinsicness, actuality, objectivity). The special ingredient however, which presumably functions as both as a necessary and sufficient condition for dispositionality (although Molnar never exactly makes it clear), is *dispositional directedness*. For a power *prima facie* appear to be directed to its manifestation –it is a power *for* something; the linguistic devices that we employed so far makes it explicitly clear: "disposed to…", "capable to…", "power of…" and so forth. Dispositional directedness, or as I will call in in this thesis, *dispositional directionality*, or simply, *directionality*, suggests a relational element in dispositionality, a connection of some kind between powers and manifestations. For one, Bird (2007a, 2007b) explicitly talks of a constitutive and definitory "manifestation relation" holding between a power and its manifestation. For some, this relational item might indeed be the mark of the dispositional. But others, even within the realist camp, have strongly opposed the idea of taking dispositional directionality as a metaphysically genuine phenomenon (for a number of reasons, that we will see in due time). Unfortunately, as a consequence, the debate between friends and foes of powers, and the internal debate between friends of powers, has proceeded without a shared understanding of

what dispositionality, or the mark of the dispositional, is supposed to be. This is obviously deleterious, for a number of reason. I will present three of them.

Firstly, without a clear grasp on the notion of dispositionality, the task of *identifying* and *counting* powers is an hopeless task. For it is unclear on what grounds something warrants being called a power –and on what grounds are arbitrary powers x and y one and the same. This is a worry that we already met; for surely, scientific lexicon abounds of dispositional expressions that we can use to refer to features of subatomic structureless particles; but are those features *truly* dispositional? And on what grounds can one reach either conclusion? If powers, as the realist maintains, are a crucial component of our ordinary and scientific view of the world, this situation needs to be addressed as soon as possible.

Secondly, this makes it unclear what the divide is between *dispositional* and *categorical* properties. This has been an historically important divide between kinds of properties, but not one that is easy to understand beyond paradigmatic examples. The confusion around "categoricity" is no less intense than the confusion revolving around "dispositionality", and no less a source of puzzlement when theorizing around properties (e.g., recently Inghtorsson 2013: 57-58). The conclusion is, once again, a lack of common ground; for the moment, it suffices to say that, on some variants of power realism, dispositionality and categoricity are mutually exclusive categories –but on other variants, they are not.

Thirdly, and finally, the lack of explicit agreement in matters of dispositionality (and categoricity) generates the danger of a void (or merely verbal) agreement between friends of powers; and the danger of a void disagreement between friends and foes. This makes talk of powers particularly elusive. Consider, by way of analogy, the debate about the existence of mereologically composite objects. There are those, mereological nihilists, who believe that there are none. There are others who believe that there are some of them; different positions differ about the nature and quantity of such things. Yet this debate has a clear subject matter: given a (formal) mereological framework, given, e.g., by the axiomatic theory of classical extensional mereology, it is clear what an object with proper part(s) is. (I will come back to this analogy later on). Things unfortunately are not so easy for powers; in the burgeoning debates between the friends and foes of powers, the "neo-Aristotelians" against their "neo-Humean" foes, it is not entirely clear what kind of entity is under scrutiny. It's not, as we have seen, as the debate is completely wrapped in darkness. Some things are clear: friends of powers want an inherently "active" world without the need of metaphysically substantive external mechanisms or principles to govern it, they are usually enemies of nomic and causal regularism, and oppose the idea of a de-modalized universe. But the question whether or not there are powers does not have a clear subject matter. Not only power ontology lacks an uncontroversial theory or framework (let alone a formal one) which might help understanding what exactly one is talking about: even worst, as we have seen, there are positions within the realist camp which crucially differ on what dispositionality is. How then can they safely agree that there are powers? This led me to believe that, although not often recognized, in this debate the risk of talking past each other is very high. Claims that the world contains either "dispositionality", or its contrary, "categoricity", or both, or neither, are very unclear, since the meaning of those words shifts uncontrollably from one source to the other.

A related issue is how seriously we should take modal or counterfactual characterizations of dispositions; one the one hand, it has often been claimed that powers are "modal properties"; this is –allegedly– an important aspect of an anti-Humean metaphysics of powers, in which a deeply modal world, a world equipped with powers, is to be opposed to the neo-Humean multiverse in which all modality is ultimately reduced to non-modal facts.

On the other hand, I would like to submit a warning against modal and counterfactual characterizations of powers. Of course powers can be heuristically characterized in those ways –for clarity's sake. Even I,

in the beginning of this Chapter, have claimed that to assign powers to objects is to describe them as they can behave, or could behave in certain circumstances; but this can't be meant as a definitory or metaphysically substantial characterization of powers –just a "clumsy and inexact" gesture towards powers (Martin 1994: 8). Similarly the claim that powers are modal properties should be handled with care –as I will elaborate in later Chapters. Modal (e.g., counterfactual) characterizations of dispositions should not be taken too seriously.

First of all, for example, how could this sugarcube's *water solubility* be defined in terms of the counterfactual "if the sugarcube was be immersed in water, it would dissolve"? Even assuming an extremely abundant conception of properties (according to which there is a property for every predicate), what could *water solubility* ultimately be? Perhaps the property *to be such that if the sugarcube was be immersed in water, it would dissolve* (the property of what exactly? The sugarcube? The water? Both of them? The whole system?). But even if that was not a problem, even if it was acceptable to somehow "crystallize" counterfactuals and possibilities into dispositional properties of objects, the goal of grounding or explaining modalities in terms of powers –one of the main reasons for accepting powers in the first place– would then be unachievable. For, defined as such, powers would themselves be nothing but counterfactuals, or possibilities. For a friend of powers which desires to ground or account for natural possibilities, necessities and counterfactuals in terms of powers, that would be equivalent of –as they say– putting the cart before the horses.

An example of this dialectic is to be found by the way in which Jaag (2014) discusses Bird's (2007a) brand of power realism. According to Bird, there are powers in the sense that at least some properties have a dispositional essence, which he characterizes as follows:

(CA$_{\Box}$) $\Box(D_{(S,M)}x \leftrightarrow Sx \mapsto Mx)$.[21]

Necessarily, for every x (I assume there to be an universal quantifier to bind x either inside or outside the necessity operator), x is disposed to M if S, if and only if it would M if S. For someone, like Bird, who accepts to characterize dispositions both in terms of *stimuli* and *manifestations*, **(CA$_{\Box}$)** is what allows to derive laws of nature, as universal generalizations, from the essence of properties (e.g., Bird 2007a: 46). Jagg (2014: 4) takes the characterization of powers in **(CA$_{\Box}$)** very seriously, and goes on to claim that, according to Bird, "certain subjunctive or counterfactual conditionals pertain to the essences of potencies", and that "subjunctives make up the "content" of a potency's essence"; therefore "potencies 'are essentially modal properties'". This leads him to the reasonable conclusion that, on this account, it is impossible for powers to account for any modality, since (ibid.) "an entity cannot metaphysically explain or ground what pertains to its own essence or what figures in its real definition".[22]

Yet Jaag's take of Bird's position is unnecessarily strong; Bird never claimed **(CA$_{\Box}$)** to be a definitory characterization of dispositions, nor their dispositionality –he merely claims it to be (as in Bird 2007a: 43) a "necessary equivalence". Perhaps something more than a "clumsy and inexact gesture" towards dispositionality, but still nothing as strong as a definition. Thus, there are reasons to deny that

[21] Bird (2007a: 43). "↦" Is our symbol for the counterfactual conditional.

[22] A number of assumptions are needed to reach this important conclusion; one is that what pertains to the essence or real definition of something is not distinct, or no distinct existence, from that very thing. The second is that grounding and explanation are irreflexive; thus, no power can ground or explain what it itself is; I will come back to many of these assumptions when I will be presenting my metaphysical background, in Chapter 2. Furthermore, in Chapter 4 I will say more on the problems of taking dispositions to be modal properties –and in which sense they can be considered to be such.

dispositions are modal properties in the sense that they are –as Armstrong (1997: 79) claimed, "congealed hypothetical fact[s] or state[s] of affairs"; and similarly, powers are not "congealed" possibilities or necessities assigned to objects: on the contrary, they are actual, non-conditional properties that are supposed to be responsible for such possibilities, necessities and counterfactuals.

Where does this train of thought ultimately lead? Even linguistically, if we exclude linguistic items from the nomic of modal family, it is almost impossible to non-circularly define powers or their dispositionality –in the end, one will still have to use some verb or adjective in the dispositional family, such as the ones introduced before. E.g., if one is not allowed to use possibility or counterfactuals to define fragility, or a disposition to shatter, what choice does one have? Something fragile (or with a disposition to shatter), is one that "can" shatter, or that is "liable to" shatter, or "bound to" shatter in some circumstance; one might also say that something fragile has a "tendency" or "propensity" for shattering; some peculiarly perverted version of philosophical English might go as far so as to claim that it is "able to" shatter, even though fragility is most likely not an ability. All those expressions, unfortunately, are ultimately dispositional in character.

It is possible that Mumford and Anjum's (2011) reaction to the problems of the conditional analysis –which ultimately led them to the postulation of a primitive dispositional modality–, might also have something to do with the idea that dispositionality itself is an unanalyzable primitive. More generally, that dispositionality might be a modal primitive, more fundamental than the dual modalities that are the subject of traditional modal logic, is a common line of thought amongst friends of powers (e.g., Borghini 2009). It is however possible that even if dispositions are a modal primitive –their modal aspect or character is thus not open to further investigation– dispositionality is not a primitive *tout court*; thus, even if completely revealing characterization of dispositionality (included its modal aspect) is not forthcoming, at least something a little more illuminating can be said about it.

3.2.1 Interlude: the Governing Challenge

In our quest for the individuation of a genuine dispositional character in properties, one should always keep in mind what I will call "the Governing Challenge". It is a common thought for many friends of powers, that powers impose a natural order unto physical reality, in the sense that they are ultimately responsible for whichever regularities there are in the distribution of properties throughout space-time, at least some of them (some others are merely accidental). This idea is often articulated through the claim that powers have a "governing role" to play, in the sense that they necessitate (and, even more strongly, metaphysically determine and/or explain) certain regularities in the distribution of properties.

Here are some additional details, with the help of an example. Suppose, e.g., that all things made of sugar have the dispositional property of *water solubility*, the disposition to dissolve when immersed in water; it is also the case that all water soluble things dissolve when immersed in water. There presumably are less-than-optimal cases, perhaps in the case of interferences, in which water soluble objects do not dissolve in water, but let us put them aside for the time being. So we have an exceptionless regularity, which we can represent schematically as:

R) $\forall x(D_{(S,M)}x \rightarrow (Sx \rightarrow Mx))$

Where $D_{(S,M)}$ stands for a disposition for manifestation M in response to stimulus S. In this case, the regularity consists in the fact that everything that is water soluble (is disposed to dissolve when immersed in water), dissolves if immersed in water.

Insofar as regularities like **(R)** are not accidental regularities, friends of powers do not believe them to be entirely contingent, nor groundless or primitive. There is something in the world explaining why water soluble things dissolve in water; this something is, not surprisingly, powers themselves. Powers explain and determine which regularities occur in physical reality; thus powers impose restrictions in the possible distributions of properties across space-time. Power realism belongs to a family of positions that believe there to be something playing such a governing role; we are, as one would expect, in firmly anti-Humean territory.

In the next Chapter I will offer an extensive elaboration on the relation(s) of determination and/or explanation presumably at play here. For now it suffices to consider a relation of governance between facts; in the case of the governance between powers and regularities, the latter, but not the former, can be easily taken to be facts. As for powers themselves, for the time being, it is still not clear exactly which fact concerning *water solubility* governs the regularity involving water soluble things dissolving in water. Perhaps the existence of the power suffices, or perhaps one needs the power to be instantiated; alternatively, as we will see below, perhaps one needs facts about the dispositional nature of properties to do any governing. I will not expand on these matters for the time being. Suffices to say that for some closed formula φ, I will simply call "φ^x" a fact that φ (which involves the power x). Thus, the governing role of powers can be summarized as follows (again, schematically):

G) $\varphi^{D(S,M)}$ governs $\forall x(D_{(S,M)}x \rightarrow (Sx \rightarrow Mx))$

Given that I have not clarified which kind of facts involving powers govern the regularities, the thesis that powers play a governing role can be taken to mean that **(G)** has true instances. Again, in our example, some fact concerning the disposition of water solubility governs the fact that all water soluble things dissolve when immersed in water.

Something crucial must be noted about this relation of governance: it is a necessary relation. Some (fact involving some) power determines a relevant regularity in a way that at least entails that it is not possible to have the (fact involving the) power, without the regularity; otherwise, powers wouldn't impose any restriction of possible distribution of properties throughout space (the necessity at play here is, presumably, absolute metaphysical necessity). Thus, I take the governing principle **(G)** to entail the following necessity **(N)**:

N) $\Box(\varphi^{D(S,M)} \longrightarrow \forall x(D_{(S,M)}x \rightarrow (Sx \rightarrow Mx)))$

In our case, **(N)** states that necessarily, as long as some relevant fact about water solubility is the case, water soluble things dissolve when immersed in water (that is to say, **(R)** obtains). **(N)**, as a direct consequence of our governing principle **(G)**, reflects the properly anti-Humean element in the ontology of the power realist.

The Governing Challenge revolves around both **(G)** and **(N)**; provided that the friend of powers manages to somehow individuate true instances of **(G)** and **(N)** for some power-fact $\varphi^{D(S,M)}$, the issue can be raised: *how* exactly do these power-facts govern the regularities? Insofar as the governing relation in **(G)** is taken to be a relation of metaphysical determination and/or explanation, this amounts to an explanatory challenge: it asks to actually articulate an explanation from to $\varphi^{D(S,M)}$ to **(R)**. Similarly, when it comes to **(N)**, we may ask how it is absolutely impossible to have $\varphi^{D(S,M)}$ without **(R)**, thus we may ask for some ground for the necessary correlation between them. In short, the power realist has claimed

that (some fact about) powers govern the regularities, yet how exactly it is impossible to have a power (the fact about…) without the corresponding regularity?

The problem in articulating how powers govern regularities is exacerbated by the fact that, as we have seen above, there are reasons to doubt that powers are modal properties in the straightforward sense of being possibilities, necessities or counterfactuals themselves. To say that something has the disposition $D_{(S,M)}$ is not the same as saying that it would S if M; and neither is the same as saying that necessarily, $D_{(S,M)}$– and S–things are also M. A disposition is neither a necessity, nor a "subjunctive fact" of any sort: a disposition is something else. Yet necessarily, given some relevant fact about the existence, or perhaps nature of $D_{(S,M)}$, then all things that are both $D_{(S,M)}$ and S, are also M. This calls for explanation. One can presume that whatever positive characterization of the dispositionality of $D_{(S,M)}$, it will need to allow for powers to play their governing role.

A paradigmatic instance of this problematic is presented when Barker and Smart (2012: 719) formulate a governing principle following Bird's (2007a) take on the dispositional, according to which to do the governing is an instance of the essential second-order directionality relation between powers, stimuli and manifestations: their principle can effectively be taken to be an instance of **(G)**. Then they go on ask (Barker and Smart 2012: 720): "in virtue of what does this necessitation between the second-order fact […] and the first-order patterns of tendency hold?".

This difficulty is not peculiar to powers, but to every position which postulates something with a governing role in nature. In fact, this is a problem that powers inherited from laws of nature, and which dates back at least as far as to Leibniz (and presumably even earlier). The Leipzig philosopher wrote, in the discussion against "rule occasionalists" who claimed that the world obeyed natural causal laws willed into being by God:

> "It isn't sufficient to say that God has made a general law, for in addition to the decree there has also to be a natural way of carrying it out. It is necessary, that is, that what happens should be explicable in terms of the God-given nature of things. Natural laws are not as arbitrary and groundless as many think."[23]

According to Leibniz, natural laws are carried out by the "powers of created things", a conclusion that many power realists today will find attractive. More recently (and more famously), a similar worry has been raised against the so-called nomological realism, or "DTA theory" espoused in Dretske (1977), Tooley (1977, 1987) and Armstrong (1983) according to which laws of nature are instances of a dyadic universal relation between universals instantiated by objects (this lawmaking universal "N" is sometimes called "second-order" in the sense that it obtains between properties of objects). On this account, laws are not regularities, but they govern such regularities. Therefore, as in Armstrong (1983: 85), we have the entailment (schematically):

NR) $N(S,M) \rightarrow \forall x(Sx \rightarrow Mx)$,

according to which, if there is a law connecting the two property universals S and M, then all Ss are M. It is crucial to notice that **(NR)** is hardly taken to be *just* an entailment, but something more: it sanctions the status of the law N(S,M) as what governs the regularity in the distribution of S and M instances throughout space-time. Thus, like **(N)**, **(NR)** can, as a governing principle, be taken to be metaphysically necessary, and can be prefixed by a necessity operator; as in

[23] Leibniz, *Philosophical Texts*, as in Woolhouse and Francks (1988).

NR*) □(N(S,M) → ∀x(Sx → Mx)).

(Again, I take the claim "A governs B" to entail the claim "necessarily, if A then B"). **(NR*)** is, mind you, compatible with a number of Humean-inspired claims endorsed by Armstrong, such as the claim that both the law and the regularity are themselves contingent; for in general the truth of □(A→B) is consistent with the contingency of both A and B. It is however the case that, necessarily, whenever a law obtains, a regularity also obtains.

Armstrong (1983: 77ff), thanks to his friend David Lewis, was the first to recognize a difficulty in **(NR)**, understood as a governing principle. For why exactly a relation between universals S and M should entail (and then necessitate, or govern), the regularity according to which all Fs are Gs –given that, as a law, it is distinct from the regularity? To make things even harder, N holds only contingently between universals (Armstrong thinks laws of nature to be metaphysically contingent), and yet it is called "a non-logical or contingent necessitation" universal (Armstrong 1983: 85), in the sense that the obtaining of N between S and M determines that all Ss are Ms. As it was first wittily noticed in Lewis (1983: 366), it is unclear why would N be "necessitating" in this sense, given that, as it is, N is merely a universal contingently holding between universals, and something wholly distinct from the regularity in the consequent of **(NR)**. Sider (1992: 261) nicely summarizes the difficulty:

> "[c]alling [N] "nomic necessitation" merely indicates that the entailment must exist. But why should some state of affairs in the lofty realm of universals, a fancy relation's holding between two universals, translate into hard facts below, facts about earthly particulars that fall under those universals?"

Van Fraassen (1989: 96) is known for articulating this difficulty in a twofold problem for Armstrong's position; first, the "identity problem" which asks the supporter of this position to clarify the nature of this lawmaking universal N, and secondly, the "inference problem", which asks how are we supposed to infer the regularity from the law ("infer" here, I take it, is roughly equivalent to "entail"). Although the term "inference problem" has gained traction in the literature, it is importance to notice that the difficulty for the nomological realist is not merely a problem about entailment, but about the governance of the laws, and their role in necessitating the correspondent regularities. For one, Lewis (1983: 366) is challenging **(NR*)** directly, and not just **(NR)**, when he confesses: "I cannot see how it could be absolutely impossible to have *N(F,G)* and *Fa* without *Ga*". However, it is perhaps worth noticing that although Armstrong (1983: 85) claims that "[a] scheme of this sort [**(NR)**] has attractive features", he never explicitly endorsed the modally reinforced **(NR*)**.[24]

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[24] One may question whether a truly Armstrongian theory of laws could reject **(NR*)** altogether, or any relation between law and regularity stronger than entailment; some passages from Armstrong may seem to go in that direction, e.g. Armstrong (1983: 86):

> "we will have to say that the entailment holds in virtue of a *de re* necessity linking the relation between the universals, on the one hand, and the uniformity it 'produces', on the other. This is the picture which I get from the *Phaedo*. The Forms up in Heaven are related in a certain way, and, as a result, a uniformity is produced on earth. Such a doctrine is extremely mysterious. The mystery is only a little reduced by bringing the Forms to earth and letting them exist only in their instantiations. We still have the puzzle of a relation between the universals which logically necessitates something distinct from itself: the uniformity."

Then again, one wonders whether Armstrong was really ready to bit the bullet according to which it is possible for universal A to necessitate universal B, and yet for some A to not be B, which, on the face of it, seems to

That being said, the inference problem against Armstrong's position, and nomological realism in general, can be understood as an issue about the entailment between law and regularity, but also about the necessity between the two –and perhaps, even more strongly, about the governance of laws.

The correlation between the inference problem and powers is explicitly clear in the case of those power realists (paradigmatically, Bird 2007a, 2007b) who think of dispositionality as a second-order directionality relation that closely resembles an Armstrongian law –the only difference being that such relations are essential of properties. A position such as this is, at the end of the day, "Armstrongian necessitarianism modified to allow for a thesis about property identity" (Barker and Smart 2012: 714), and as such –as they rightly notice– it suffers from a strikingly similar problem: how can this second-order dispositional relation determine first-order regularities in the distribution pattern of powers, stimuli and manifestations? How can dispositional directionality, as the nature of (dispositional) properties, govern the regularities in this way?

Following Barker and Smart (2012) and Barker (2013) some people have started to refer to this difficulty for power realism as the "governing problem". However, I like to think about it as a Governing *Challenge* instead, which imposes some constraints in our quest for dispositionality. Here is the threat upon which any challenger needs to rise above: that of primitivism, or mere stipulation. *Prima facie*, it is viable, for the nomological realist, to claim that the necessary correlation in **(NR*)** is a brute necessity; in Chapter 2, I will argue that such things should be preferably avoided, but perhaps "we may view the introduction of the necessitation relation as a theoretical posit, analogous to the positing of subatomic particles in physics to account for various data" (Sider 1992: 275). However, a friend of powers should thread very carefully around this solution; roughly put, **(N)** states that there is a necessary connection between some features of an object and how it behaves in a given circumstance – something that the neo-Humean cannot accept. Yet this is not the ultimate bone of contention between power realists and neo-Humeans: more specifically, their bone of contention is not about whether there are (brute) necessities, but about whether there is something (powers) providing the world with such necessities. A power realist should not simply reject neo-Humean metaphysics by adding to the world brute necessities such as **(N)**, but rather by adding something (in this case, powers) that provide the world with necessities (Barker 2013: 621).

In the course of this thesis I will, on multiple occasion, discuss the Governing Challenge and some of its byproducts. Relatedly, this will be an occasion to discuss the "deflationary" and "stipulative" axiomatic solution to the Governing Challenge suggested in Schaffer (2016), which ultimately will lead me to the conclusion that perhaps there is a viable stipulative solution for the friend of powers as well, (albeit not one that takes instances of **(N)** as primitive).

What about a non-stipulative solution? Quite interestingly, as I will argue at the very end of the thesis, the candidate for the role of dispositionality that I will propose to settle the question of realism for powers –and to ground (dis)agreements between friends and foes of powers–, is inherently incapable of rising to the challenge, and constitutes little more than a statement that the challenge exists in the first place. This is an interesting result, to the extent that it shows that power realism, *per se*, is only programmatically a departure from neo-Humean metaphysics; it merely posits governing powers, rather than properly articulating a power-based explanation as to why there are anti-Humean necessities (and ultimately, regularities) in the world.

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defeat the whole enterprise. Relatedly, Armstrong accepted the challenge by Lewis (1983: 366) framed as an objection to **(NR*)**, even though he never explicitly endorsed this principle. I leave these details for another time.

3.3 A New Theory of Everything?

We finally arrive to the third source of obscurity that plagues power realism. To see it, we need to be able to see the big picture. Insofar as powers are considered properties of objects, a realist theory of powers is a theory of properties –or something in the vicinity thereof. But it never is just that. Because powers are considered the cornerstone of a revolution in metaphysics, the admission of powers in the ontology ripples in all other areas, from laws of nature, to causation, to modal ontology and semantics, to theories of properties and objects –and perhaps even further, to theories of change and persistence through time, and the philosophy of mind. Overall, some friends of powers may want to target a "passive", "static", and "atomized" view of the world that is ultimately neo-Humean in character. Contrariwise, when Lewis (1997: 148) was defending the conditional analysis against those, like Martin, who accepted powers in their ontology, he argued that perhaps not all of us want "a new theory of everything", but only "a new analysis of dispositions that gets right what the simple conditional analysis got wrong". I suspect that many friends of powers today want a new theory of everything, albeit they do not always make it clear. The downside, of course, is that this makes the price of admission for powers very high. As we have seen before, the Argument from Science does not usually shoulder the weight of defending power realism on its own; a different kind of approach available to friends of powers, and one which is quite often employed, either implicitly or explicitly, is a cost-benefit methodology perhaps not dissimilar to the one that Lewis (1986b) used to argue for his possible worlds ontology. It goes something along those lines: it is surely a cost to admit powers (assuming we understand what is truly at stake here –see the previous section); but the cost is heavily mitigated, and perhaps even outweighed by its benefits. This means, amongst other things, that the discussion between friends and foes of powers usually bleeds in all other areas of philosophy –in a way that is almost impossible to exhaustively map.

Thus, a third potential source of obscurity in the realist's position is exactly how metaphysically revolutionary the adoption of powers really is. This is not a question that I can hope to answer in its generality; but there is an instance that nicely intersects with some debates introduced in the previous section, and which has often given me pause. We introduced the idea, sometimes espoused by friends of powers, that the mark of dispositionality is a relational item known as dispositional directionality. For those who accept it, directionality is allegedly a constitutive element of a power (e.g., Molnar 2003: 60). Similarly, Mumford (2006: 483) claims that "to be a disposition is just to be directed towards some possible manifestation". It may therefore being the case that a world of powers is a world in which relations, instead of properties, play some privileged role. Therefore, the third goal of this thesis is to clarify how the adoption of powers is consistent with a standard metaphysical conception in which objects display independent instances of monadic, intrinsic properties –that is to say, the object-property view we all grew up with. For a common objection to those who support a deeply relational notion of dispositionality is that they strip away the world of any intrinsic or substantial character –in some way or another, they strip the world naked of properties, and perhaps of objects as well. For instance, criticizing Boscovich's atomistic theory of material points with no shape, mass, or volume, characterized only in terms of their capability to move with one another according to a law of attraction and repulsion, Campbell (1976: 93) asked:

> "[i]s it possible for anything to be constituted by nothing by causal powers? Whatever the answer to *that* question, I doubt very much whether it is possible for *everything* to be constituted by nothing but causal powers. But that seems to be the situation in Boscovich's system. When one point moves another, all that has been shifted is a power to shift powers to shift… But powers to shift *what?*"

More recently, Heil (2003: 97-98) commenting a position known as the Pure Powers view, which indeed typically espouses a relational conception of dispositionality:

> "Although a conception of properties as pure powers does not force the abandonment of a time-honoured substance–property ontology, the daring thought that all there is to the material world are 'centres of attractions and repulsions' pushes in the direction of a 'bundle theory' of objects, a theory that promises to banish all but powers from the material world. If an object's qualities are reduced to or replaced by pure powers, anything resembling substantial nature fades away. […] Far from considering this a problem to be overcome, proponents of the thesis that properties are pure powers are more likely to regard the demise of the traditional substance–property ontology as liberating. A dynamic conception of reality replaces the static seventeenth- and eighteenth-century conception of inert substances propelled by external forces."

Of course a friend of powers is not forced to "banish all but powers from the material world"; a world with powers must not necessarily be a world built *only* out of powers. However, it is true that there are versions of power realism that might dissolve objects and properties into a "relations all the way down" kind of ontology. Powers may have (albeit not necessarily) a "liberating" effect in this sense; and I will discuss such cases extensively in the course of this thesis. Similarly, some power theorists appear to be committed to a picture of reality not dissimilar to that of some scientific structuralists. And there are notable interactions between power realism (especially under a relational understanding of dispositionality), and the most radical of those structuralist positions, viz., *ontic structural realism* (as in Esfeld 2009). (Keep in mind, additionally, that ontic structural realism is itself subject to various interpretations; it can be taken to claim that there are relations without *relata*, or that there are relations without non-relational *relata*, or, even less radically, that there are relations holding between non-relational *relata* (perhaps objects), but no intrinsic properties). Thus, there are indeed versions of power realism that thread uncharted territory; and contrariwise, there are friends of powers that are most clearly enemies of relations. They have a completely different take on what the "powerfulness" of powers amounts to –and their overall view of the world is thus radically different.

Therefore; it is obscure just how much power realism is compatible with a more ordinary view of the world that does not eliminate intrinsic, monadic property, and material objects that bear them. This is related to the previous point about the problems in finding a positive (and possibly relational) characterization of the dispositional character of properties. But now the emphasis is on how metaphysically revolutionary the acceptance of powers must be –and whether it is consistent with a more ordinary conception of objects and properties.

This point has always seemed important to me, in the overall evaluation of realism about powers. For the metaphysical revolution that has powers as its cornerstone need not be an all-or-nothing matter, in which one needs to jettison our ordinary worldview at the very start. First of all, because this is an exceedingly hostile and unhelpful attitude to have in a discussion, and presumably one that will not win power realism any friends; secondly, I have yet to see a theory of powers that fully explores its potential ramifications in all other areas of philosophy; this makes it incredibly hard to comprehensively evaluate realism about powers as a metaphysical stance. Sometimes baby-steps are better: let us see if there is a theory of powers that is consistent with a more ordinary conception of the world. As a consequence, the clarification of this obscurity regarding power realism also has another aim. For if power realism is indeed consistent with our ordinary view of the world, made of material objects with intrinsic, monadic properties, that would make it much more palatable for those of us with more conservative tastes. And

if that holds only for some variant of power realism, that would make it for an significant advantage over its rivals.

Before moving on, I would like to offer some clarification about this "conception of objects and properties we all grew up with". First of all, am I assuming that there are properties? This seems to be a common assumption in the debate about powers –which are sometimes called dispositional *properties*, as opposed to non-dispositional, or categorical properties. In Chapter 2, presenting my background metaphysical assumptions, I will discuss my stance on powers and properties.

Secondly, one may question the whole operation I am embarking into. If it is indeed the case that powers constitute a new metaphysics, inherently more congenial to contemporary science (as, paradigmatically, Dorato and Esfeld 2010 argue for the GRW formulation of quantum mechanics), why should we expect them to befit an ordinary, pre-scientific view of the world, with macroscopic objects bearing intrinsic and monadic properties? I believe this objection to be off target. A recurring theme of this introductory Chapter has been that justification for the admission of powers in the ontology cannot merely come from science; it can't merely come from the Argument from Science, nor merely from the naturalness of the interaction between powers and contemporary science. Powers are, after all, a product of philosophy –and, more specifically, metaphysics. Metaphysicians slowly started to believe in the reality of powers for reasons that, in all honesty, have nothing to do with the GRW interpretation of quantum mechanics –or any other scientific theory for that matter. On the contrary, scientists have used dispositional lexicon way before metaphysicians believed the world to be imbued with dispositions –and will more likely continue to do so in the eventuality that powers become unfashionable again. I cannot embark on a full debate about the relation between science and metaphysics, but I believe there to be at least some independence between the two disciplines. To completely tie down powers to contemporary microphysics and the extreme worldviews of its debatable interpretations, is a potentially dangerous move, given that powers are introduced in the philosophical landscape for (at least partially) independent reasons. We have seen in the beginning of the Chapter that dispositions prominently appear in *both* a scientific and everyday picture of the world; therefore, it is interesting enough for a metaphysician to wonder whether the existence of powers is really consistent with a more ordinary worldview.

3.4 Three goals, summarized

In this section I have discussed three ways in which the position of the power realist –one who claims this to be a world with powers- is unclear in its current formulations. First of all, it is unclear what the bone of contention really is –if it is the existence of something, or what we can expect to find at a fundamental level (if there is one)–, or if it is a debate about the nature or properties, or again, about the conditional analysis of dispositional ascriptions. Secondly, even admitting that the debate is about the existence of something displaying a "dispositional character", it is highly unclear what this dispositional character ultimately is. Many would consider dispositionality to be a primitive; others have proposed some more positive characterization of dispositionality, e.g., in terms of dispositional directionality. But there is no agreement as to what exactly counts as a power; additionally, whatever candidate one wants to put forward, it has to rise to the Governing Challenge –it has to make it clear how exactly dispositions are able to govern first-order distribution pattern of properties throughout space-time. Thirdly, it is unclear just how metaphysically revolutionary the admission of power is –more specifically, it is unclear whether (and in which formulation) it is compatible with an ordinary conception of the world in which material objects are bearers of monadic and intrinsic properties.

Overall, my goal is to clarify the realist's position (in the ways described), and relatedly discuss and evaluate two of its most famous variants –the Pure Powers view and the Powerful Qualities view.
The clarification of the realist's stance is, to my eyes, an important task to fulfill. For, as we have seen, there are important explanatory roles that powers can play in a unique way in metaphysics –first and foremost (but not only), in the treatment of modality. And yet, without a clear grasp of the realist's proposal, it is hard to take powers as serious candidates for the role. This is a situation I plan on alleviating.

4. Plan for the thesis

The thesis is structured as follows. First of all, in Chapter 2, I will –so to speak– put my cards on the table: I will present the metaphysical, metaontological and methodological assumptions that will guide the rest of the work: they constitute the backbone of the worldview upon which I will discuss powers. I will not specifically argue for any of those assumptions, although I will occasionally discuss their plausibility and present some reasons as to why I embrace them.
In Chapter 3 I will deal with the first source of obscurity; and characterize with more precision the "question of realism for powers". This Chapter is therefore crucially metaontological in character, and will help the reader visualize the debate more clearly. Some of the aforementioned characterizations of power realism will be shown to be lackluster, or even extensionally incorrect when it comes to the actual state of the debate. I will successfully identify a primary sense of the word in which friends of powers should be called "realists", and their adversaries "antirealists". This involves some property, or features of object, having a *dispositional* character, which leads to the next Chapter.
In Chapter 4 I will begin my quest for dispositionality, viz. the mark of the dispositional. I will introduce and discuss the divide between "dispositional" and "categorical" properties: what is it that makes the former dispositional (viz., in what does their dispositionality consist)? And what is it that makes the latter categorical (viz., in what does their categoricity consist)? I will discuss some traditional (but to my eyes, severely problematic) ways to set up the divide, and provide an extensive taxonomy of power ontologies; incidentally, an useful "roadmap" of power ontologies will be sketched to help the reader orient herself. Finally, Chapter 4 is where I will introduce the relation of *dispositional directionality* as a potential mark of the dispositional, thus motivating the next two chapters; in Chapter 5 I will discuss the intrinsicness of powers. The tension between the intrinsicness (and latency) of powers, and their alleged relational nature generates a well-known difficulty called the Meinongian Problem; which is supposed to defeat the idea that dispositional directionality is a metaphysically genuine phenomenon. This is the topic of Chapter 6; its conclusion will be that the Meinongian Argument is in fact inconclusive, but it forces us to consider further metaphysical assumptions.
By this point of the thesis we will have a good grasp of the state of the debate and it will be possible to introduce the Pure Powers view and the Powerful Qualities view. In Chapter 7 I will introduce the Pure Powers view; in the current formulations I will consider, the Pure Powers view is usually associated with a deeply relational view of dispositionality (as in Bird 2007a, 2007b). An argument called "identity regress argument" has been recently raised against it: I will discuss the argument –which will be shown to consist in a family of loosely related arguments; some of them will reveal themselves to be quite crippling for the position. Given that the identity regress argument crucially revolves around the claim that powers have their identity "fixed" by their manifestations, this Chapter will also be an opportunity to explore intriguing themes about the identity of powers, and the fixing thereof.

The discussion about the identity regress argument against the Pure Powers view will ultimately reveal just how metaphysically revolutionary this view really is. In Chapter 8 I will discuss the Powerful Qualities view, an overall more conservative stance which rejects the idea that dispositionality is a relational element; as such, is not as problematic as the Pure Powers view. However, because of the "surprising identity" (Martin 1997: 216) that it posits between the categorical and the dispositional, this position is a possibly obscure one; it is also a very unstable one, as the question of how exactly can categoricity and dispositionality coexist in a (simple) property may deflate it into a metaphysically less substantial position. I argue for the existence of stable and metaphysically substantial version of the Powerful Qualities view, according to which simple properties are both categorical and dispositional. However, this requires some degree of manipulation of the claims often put forward by PQers –which leads to interesting consequences on its own.

Finally, in Chapter 9, I will say some final words on dispositionality. Because the Pure Powers view and the Powerful Qualities view are supposedly two variants of power realism, and because only one of them accepts directionality, considering dispositional directionality as the "mark of the dispositional" would grossly mischaracterize the logical space of positions within the realist camp. By opposing the Powerful Qualities view with an artificially constructed antirealist position, we will be in a position to observe, by way of contrast, the true mark of the dispositional that sets apart (all) power realists from their adversaries. Insofar as this mark of the dispositional cannot answer the Governing Challenge, the conclusion will be that, when properly understood, power realism exists, as a metaphysical reaction to neo-Humeanism, in a merely programmatic state; for, as it is now, power realism consists in nothing more than a stipulation that there is something making this world anti-Humean (a stipulation of governance perhaps not too dissimilar to the ones considered by Schaffer 2016). Perhaps this is the end of the story; but, more interestingly, power realism may just be waiting for future developments, and this thesis is just a stepping stone towards a deeper and more complete understanding of dispositionality.

CHAPTER TWO
THE WORLD WE LIVE IN

5. Introduction

In this Chapter I will –so to speak– put my cards on the table: I will present the metaphysical background I find the most congenial, and discuss some issues of method to contextualize the rest of the work. This will take the form of a number of assumptions on a wide variety of topics –a diverse and gerrymandered collection of claims, perhaps, but one that ultimately forms a somewhat orderly landscape. I won't argue for all of those claims, although I will occasionally discuss their plausibility and present some reasons as to why I embrace them. Enquiry, after all, must start from somewhere: for me, there is no better place to start than this.

6. Metaphysical realism, modal realism, and modal magic

First and foremost, I take myself to be a *metaphysical realist*, in the broadest characterization of the term. This has to do with the goals and ambitions of metaphysical enquiry: I take metaphysics to consist in the discovery and understanding of an objective (viz., language- and mind-independent) reality that surrounds us, and which we are part of. The goal of metaphysics is to describe and conform to this reality. This may seem to conflict with my previous statement in Chapter 1 that this thesis "lean[s], if anything, on the prescriptive side of metaphysics". The conflict is merely apparent. My prescriptive rather than descriptive attitude in that passage was relative to the debate about powers, rather than about the reality that debate was about. In rejecting a descriptive attitude with regard to the debate, what I meant was that, as I claimed "I have no interest, *per se*, in the reconstruction of the debate". Roughly put, my aim is to *prescribe* a better, clearer formulation of power realism and its claims, in order to better *describe* the reality of a world with powers.

How plausible is such a general and almost naïve metaphysical stance? After all, one will admit that much of what we find in our everyday lives, many entities, features, distinctions and so forth, are inherently human constructs, built by language and thought through centuries, of not millennia, of cultural evolution. That this trend should generalize to everything is a *per se* unwarranted conclusion; however, realism, as a metaphysical claim, immediately redirects to a number of semantic and epistemic claims as well –which are usually the ones questioned by antirealist philosophers. I do not have the time to discuss these issues here, for they are not the topic of this thesis. My realist stance is not however entirely unmotivated, and not completely naïve. In this section (and partially, in the next one), I will try to shed some light on it –on its details and motivations.

First of all, metaphysical realism is the background that I find the most congenial, and one that has unavoidably be present throughout all of my work on causal powers (I will shortly explain how metaphysical realism makes its presence felt). Acknowledging it is simply a matter of record: for it is an assumption I cannot do without. As for Sider's (2011: 22-23) "knee-jerk realism", reconsidering it from the get-go "would require a reboot too extreme to contemplate". And neither I have the time nor the means to exhaustively argue for it, as, like Sider, "I have no idea how I'd try to convince someone who didn't share it". Whether or not that counts as a philosophical failure, remains to be seen.

Secondly, a methodological clarification may make this assumption more palatable: metaphysical realism can be seen, in the context of this thesis, as a broad starting point of the discussion, rather than a specific indisputable dogma. As I introduced it, metaphysical realism is a very general claim –which

leaves it open whether it, or some more specific claim, can still be open for negotiation, without thereby betraying the spirit underlying it. For example, metaphysicians of realist sympathies have sometimes subscribed to a principle called *Truthmaker Maximalism* (TM), according to which for each truth, there's something in the world that makes it true (viz., its truthmaker); this position is famously problematic, as there are truths for which we struggle to find truthmakers, e.g. modal statements and negative existentials. Whatever option one finds preferable to get out of this tangle, I do not consider the rejection of TM as an unacceptable price to pay for the metaphysical realist. Perhaps some truths, but not all, have truthmakers.

Or, as another example, a source of puzzlement for the metaphysical realist might be the presence of arguably "epistemic" items in her toolkit. This is betrayed by the overabundance of expressions such as "because" or "in virtue of" in metaphysical literature. Perhaps the oldest and more venerable example would be Plato's *Euthyphro*'s dilemma: "[i]s the pious being loved by the gods because it is pious, or is it pious because it is being loved by the gods?".[25] Insofar as the author's goal is patently to establish some kind of primacy between *being pious* and *being loved by the gods*, this is *prima facie* relevant to metaphysical enquiry. However, expressions such as "because", as recent research made abundantly clear (Thompson 2016, Maurin Forthcoming), point to an inextricably epistemic notion of explanation. Roughly speaking, we can take an explanation to consist in a because-answer to a why-question; back to Euthyphro's dilemma, one could see it as the opposition between two pairs of why-questions and because-answers. The first pair: "why is someone loved by the gods?", "because he is pious"; the second: "why is someone pious?", "because he is loved by the gods".[26] Yet tying explanations to why-questions and because-answers makes them subject to a number of constraints that I would struggle to qualify as objective. The context of utterance of a why-question will most likely put some constraints on the appropriateness of its because-answers, which in turn will need to be "helpful" or "clarifying" for the agent that is doing the questioning. A because-answer is, crucially, something that clarifies and enlightens, something that makes the subject matter clearer to the agent doing the questioning. As in Kim (1994: 54):

> "[E]xplanation is an epistemic affair […] The idea of explaining something is inseparable from the idea of making it intelligible; to seek an explanation of something is to seek to understand it, to render it intelligible."

Therefore, metaphysical enquiry might depend, at least in part, on inextricably human matters, on the questions we decide to ask and the answers we perceive as appropriate. This doesn't need to be a knock-down defeat for the metaphysical realist, as metaphysics may ultimately be a mixed bag of objective and subjective elements, that still leaves some room for the realist to move into (e.g., perhaps some because-answers, in a given context, are objectively better than others, as in Thompson 2016).

Finally, how does metaphysical realism make its presence felt in the course of this thesis? Overall, there are multiple ways in which metaphysical realism influences my thought process. First of all, whenever

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[25] *Euthyphro*, 10a. Plato's translations are from Cooper (1997).

[26] Why the two pairs of questions/answers constitute an opposition? That the Euthyphro example is a dilemma, is underpinned by the intuition that the two pairs of questions/answers are in fact mutually exclusive: if being pious explains being loved by the Gods, the other way round can't be the case. There are reasons to think that Plato in fact held quite sophisticated assumptions about the properties of explanation (e.g., asymmetry); see Correia and Schnieder (2012).

faced with a conceptual, semantic or linguistic distinction, I will try to legitimize it by searching for a correspondent deeper metaphysical distinction; whenever that task will be impossible, I will more likely discard the initial distinction as of no importance. And whenever faced with a truth, I will search for something to account for it; that lacking, I will probably lose interest in that truth (with the *proviso* offered before).

Furthermore, metaphysical realism manifests itself in the more specific assumption of *modal realism*. I take myself to be a modal realist –not in the sense that I believe in a plurality of concrete possible worlds (I always thought that to be misnomer)–, but because I believe in the existence of an objective modal reality. Modal truths are about that reality. Thus there are modal truths, and they are true in the same way in which non-modal sentences such as "Paris is the capital of France" are true: I reject any "expressivist", or "non-cognitive", or "non-factualist" stance on modal discourse. I am no fictionalist either. And finally, I do not particularly enjoy Blackburn's (1993) "quasi-realist" approach, which is at heart a version of modal antirealism that also wants to enjoy the benefits of true modal discourse as intended by the realist. Nor do I recommend this attitude to anyone, realist or antirealist alike. If you want to be a wolf, be a wolf, and ditch the sheep's clothing. Because modal discourse is usually regimented through the help of the dual sentential operators of possibility and necessity, modal realism can be standardly intended as the claim that there are objective modal facts in the form of possibilities and necessities.

Here is a further rule of thumb: there is no modal magic (to use a famous expression coined by David Lewis). What do I mean by this? I mean that, although there are possibilities and necessities in the world, many of them have to be accounted for, grounded or otherwise explained through something else: for they are superficial or skin-deep features of this world. This is however a tricky claim, and I need to thread carefully around it. Here is a toy-example. Let us suppose that Clark Kent and Superman are necessary co-existents: necessarily, if one exists, the other does as well. Here we have a necessity. But it is not a brute necessity. It can be explained in terms of the identity between Clark Kent and Superman. It is no mystery then that one always accompanies the other, for they are one and the same thing. That Clark Kent and Superman are necessary co-existents is not a basic fact; what is (more) fundamental is rather that Clark Kent and Superman are identical. Identity is not the only item that can afford such an explanation; a part-whole relation can do the job as well, or, as some have argued, a supervenience relation.[27] As a consequence of this, I do not like modal definitions, for example Lewis (1986c: 44) definition of a universal as something that "might be instantiated many times over", or Lewis and Langton (1998: 344) definition of an extrinsic property as a property that can be instantiated by an object "whether it is lonely or whether it is accompanied". Although similar characterizations can surely be enlightening, up to the point of being extensionally adequate, I can't take them to be as full-fledged definitions, or metaphysically substantial characterizations of their subject matter. Modal facts such as these –that some property can be instantiated many times over, or that some property can be had either in solitude or accompaniment– are superficial facts that still needs explaining. The previous definitions would therefore not accomplish much by the way of metaphysical enquiry: for one still needs to explain *why* a universal can be instantiated many times over, or *why* (the instantiation of) an extrinsic property is modally independent from loneliness and accompaniment.

[27] For the part-whole relation, see the discussion about the "modal magic" of structural universals started by Lewis (1986c). As for *supervenience*, I will never make use of it in what follows, for I am of the opinion that, as a modally defined relation, it is in no position to explain any modal phenomenon itself. A claim of supervenience does not solve a modal mystery –it merely states it.

As I said before –I have to thread carefully around these claims. For if one enforces my rejection of modal magic with too much zeal, one ends up with the claim that modality is never fundamental. This is a very strong claim, and one which I'm not entirely comfortable with either. This is why I said that "no modal magic" is more of a rule of thumb; and why I claimed that *many* (rather than *all*, or even *most*) possibilities and necessities needs explaining. The simplest way to see how modality creeps back in is by considering our toy-example again. The reader will perhaps have noticed that the identity between Clark Kent and Superman explains their necessary coexistence *via* a patently modal assumption: that identity is a necessary matter. If it was merely contingent that Clark Kent and Superman are identical, even if they were, it wouldn't follow that they were necessary co-existents. For this explanation, which works in a similar way to a deduction, a conclusion with a necessity does not follow without a premise with a necessity as well. No necessity in, no necessity out.[28] At least some of those who think that there is modality at the bottom, I suspect, are moved by a similar kind of reasoning: an excellent example of this situation is to be found in the debate about the necessity of laws of nature –and its ultimate source. For example, Lange (2009: 155-156) posits subjunctive facts at the bottom of the universe, which confer each other, and ultimately laws of nature, their necessity. Similarly, as introduced in Chapter 1, Armstrong (1983: 92ff) needs to explain how the relation of so-called "nomic necessitation" is going to ensure, with some modal strength, that whenever the law obtains, objects behave according to it; he goes to some way to ensure that nomic necessitation is not brute primitive modality, and tries to provide an "independent fix" to it –but, unless this independent fix is provided by something modal in itself, how can this necessity arise? Armstrong's attempt to provide an "independent fix" on nomic necessitation may strike like an attempt to conjure modality from thin air.

It is not my place to settle this difficult issue: whether or not there is modality at the bottom (if there is such a thing as a bottom, viz. a fundamental level of reality). However, many of those who claim that there is modality at the bottom would *still* claim that there are no brute possibilities and necessities –e.g., that the modality at the bottom does not simply take the form of an unexplained possibility or a necessity (e.g., Lange 2009: 143). In the literature about powers, Vetter (2015: 198) –who offers a power-based account of metaphysical modality, according to which every possibility is accounted for, by way of definition, by a potentiality possessed by objects–, doesn't take this to consist in a "reduction" or elimination of modality from the fundamental level:

> "The account does not expel modality from the fundamental level, if there is one. Rather, it tells us where to look for modality: in the properties of objects. We can think of the account as providing an explanatory re-ordering within the package of modal concepts, putting the notion of potentiality at the basis, and building other notions –in particular, that of possibility, on top of it."

Although I am not subscribing to this account in particular, I very much like this attitude. It ties back to the claims put forward in Chapter 1, according to which friends of powers, if they want to propose a genuine alternative to neo-Humean metaphysics, have to answer to the Governing Challenge: they cannot merely postulate primitive necessities, but they have to add something (viz., powers) that provides the world with such necessities. That "something" might –in some sense or another– be modal itself. Thus, I cannot endorse the very strong claim that modal features always need to be

[28] Remember, however, that in modal logic, it is possible to have modal conclusions without modal premises (e.g., assuming the T axiom schema: $\varphi \vdash \Diamond\varphi$).

grounded in non-modal features, in what would ultimately present itself as a reduction of modality.[29] The contrary picture, that of Lewisian neo-Humeanism, is that of a world that is fundamentally non-modal (as in Sider 2011: 316ff).

There is however no space here to argue for the full thesis that there *never* are fundamental possibilities and necessities. Therefore, I reiterate the "no modal magic" maxim as a rule of thumb: possibilities and necessities *usually* call out for an explanation. Here's an advice on how to proceed: whenever one encounters a modal definition, distinction, or notion, especially if it employs the notions of possibility and necessity, there is probably something more interesting to say, even if some kind of modality could still be presupposed (as in our toy-example of Clark Kent and Superman). The background idea is that, although there is an objective modal reality, it will not ultimately present itself as a realm of unadulterated possibilities and necessities.

7. Metaontological juggling: existence, truthmaking, grounding

3.1 Quinean metaontology and the issue of realism

My claim of metaphysical realism leaves it open *how* exactly we are going to proceed in our enquiry of discovering reality. This metaontological question also concerns reality itself, and how it is constituted.

A position that established somewhat of an orthodoxy, claims that the job of discovering reality proceeds by extracting ontological commitments from language. This position, which I will call "Quinean metaontology" in honor of its father, is the position according to which one should be ontologically committed to whatever one quantifies upon in an apt first-order regimentation of the best theories (reference through individual constants, for Quine, was not equally committing). As in Quine (1948):

> "We can very easily involve ourselves in ontological commitments by saying, for example, that *there is something* (bound variable) which red houses and sunsets have in common; or that *there is something* which is a prime number larger than a million. But, this is, essentially, the *only way* we can involve ourselves in ontological commitments: by our use of bound variables."

For clarity, it should be made clear that ontological commitments are first and foremost those of a theory, or a collection of true sentences: they are whatever collection of entities is needed for the sentences to come out true (loosely speaking). Then the philosopher should be committed to the entities to which our epistemically best theories are committed; this "should" serves to highlight that this second part of the account is prescriptive, rather than descriptive –and functions as a method or guideline to proceed in the metaphysical enquiry. A commonly associated thought in Quinean metaontology is that the job of metaphysics is to find out what exists, which is entirely capture by first-order existential quantification. Reality is made up by existents, which are revealed to us by their role as value of bound variables, in a suitable domain of quantification.

In this picture, avoiding undesired commitments is done by the manipulation of key sentences in the object-language. A "conservative" way to deny additional ontological commitments is to provide sentences where the correspondent bound variables flank an identity sign, and on the other side of it

[29] Because, as in Chapter 1, powers are not simply *de re* possibilities, the claim that modal features need grounding in non-modal features cannot be equated to the claim that dispositional features need grounding in non-dispositional (viz. categorical) features. To be sure, I take both claims to be false. I will come back to the grounding of powers in the next Chapter.

we have variables committing us to something we are already ready accept. Through identity, the commitment to some variable value can be made "parsimonious", or "ontologically innocent" (Lewis 1991). Another, perhaps more common, "eliminative" rather than "conservative" way to avoid ontological commitment, is by way of paraphrase, in which it is shown that quantification over some kind of entity can be paraphrased away from our best theories.

Because I am a metaphysical realist (in the sense explained above) I find myself within the ranks of those who are always wary of "reading off" the ontology from language. This danger is inherently present in this metaontology, since according to it all ontological commitments are ultimately relative to a theory, or a language. This is a danger that many metaphysicians have perceived in recent times, e.g., Heil (2003, 2012), Dyke (2007), and Cameron (2008). Paradigmatically, Heil (2012: 151-152) wrote about Quinean metaontology as follows:

> "you are ontologically committed to whatever you ineliminably 'quantify over' in your best theories […] If you cannot paraphrase of analyse talk of trees into talk of collections of particles or perturbations in the quantum field, then you are committed to the existence of trees as distinct from –something other than, something *in addition to*– collections of particles or perturbations in the quantum field.
> Whatever its epistemological merits, this ostensibly innocent precept has proved disastrous for ontology. Its very familiarity makes it difficult to appreciate is radical nature. Perhaps more than anything else, acceptance of Quine's dictum is responsible for the current fashion for fusing metaphysics and philosophy of language."

There is much that I, as a metaphysical realist, would like to concede to this attitude. It is true that a naïve metaphysician, sympathetic to metaphysical realism as I intend it, should be more careful in treating Quine's (1948) standard of ontological commitment as a spearhead of genuinely metaphysical enquiry; for in Quine's claim that ontological commitments are always relative to language or theory, there's more than a nuance of Carnap's deflationism about ontological enquiry. As in Quine (1966, 211):

> "Carnap maintains that ontological questions […] are questions not of fact but of choosing a convenient conceptual scheme or framework for science; and with this I agree only if the same be conceded for every scientific hypothesis."

If ontology and science alike are but a question of "choosing a conventional conceptual scheme", the claim that ontology is on the same boat as scientific enquiry should not be taken as a compliment to the former, –but rather as a potential worry for the latter (Price 2009). Thus, the idea goes, a friend of metaphysical realism should steer clear from Quine's metaontological stance.

The story is more complicated than that; and I am not convinced Quinean metaontology should be considered a natural enemy of metaphysical realism. As I claimed in the previous section, my realist stance is a "dialectic" starting point, and a very general one at that, that does not straightforwardly rule out any metaontological stance from the get-go. Additionally, some of these objections occasionally rely on unjust oversimplifications of Quinean metaontology; and finally, a deeper worry is that the alternative is equally, if not more, problematic. I will discuss these two observations, in turn. (As a clarification, the reader should remember that Quinean metaontology has many adversaries of many different kinds. I cannot discuss them all, since I lack both space and a reason. The adversaries that I consider are the only the ones mentioned before, whose motivations come from metaphysical realism).

First of all, it seems to me that many similar criticisms to Quinean metaontology are occasionally over reliant on unhealthy simplifications. For example, Heil (2012: 9) mockingly characterizes the straightforward acceptance of relations in what he calls "linguisticized metaphysics" as follows:

> "What's the problem? There are relational truths; we *quantify over* relations; so we are *ontologically committed* to elations. No big deal."

(Note that for the orthodox Quinean philosopher, relations, insofar as they expressed by polyadic predicates, would belong to the ideology, rather than the ontology of a theory. Never mind that). What's wrong with this picture? Well, it is too simple. The Quinean philosopher is not committed to relations if quantification over them is eliminable; Quinean metaontology is obviously not so generous so as to force on its supporters commitment to anything we quantify over in any true sentence. This justifies the emphasis on paraphrases; some truth may commit us to the existence of holes in cheese; yet this commitment can (should) be paraphrased away. For example, there may be a paraphrase that expresses the same content, yet is not committed to holes. Sentences about cheese having holes do not appear to belong to any specific "theory" –yet perhaps the paraphrase should be accepted, and the original sentence discarded, merely for parsimony sake: if I can express the same content by committing myself to *less* entities, why shouldn't I?[30]

However, even with this methodology in mind, I still think that there are some arrows in the quiver of the enemies of Quinean metaontology. For, as it stands, Quinean metaontology provides a prescriptive method for obtaining one's ontological commitment by constantly shifting to better theories and more parsimonious paraphrases. But for the metaphysical realist, reality is not "prescribed" in any sense of the word. By way of paraphrases one can eventually reach the best and more parsimonious sentences, given the resources of one's language; but there is no assurance that they faithfully mirror reality. In general, there is no certainty that there is an absolutely perspicuous language from which we can read off the ontology. And even if there was, we wouldn't be in a position to know which one it is. Therefore, the metaphysical realist may fail to understand the emphasis that Quinean metaontology puts on paraphrases and reformulations. This comes in the form of a twofold claim: *the best theories and sentences are neither necessary nor sufficient to get the ontology right*. Firstly, they are not sufficient: reality could be simpler and more parsimonious than any best description of it. For the staunch metaphysical realist, numbers might be indispensable in our best scientific theories, and they could still fail to exist –this is indeed a move open to anyone who wants to argue against the so-called indispensability argument based on the rejection of the Quinean standard of ontological commitment (Azzouni 2004). Secondly, they are not necessary: reality could be messier and less parsimonious than our best depiction of it. For a staunch metaphysical realist, there could be all manners of nominalistic paraphrases that do away with numbers, universals, or what have you, but eventually such things could still exist; such paraphrases would therefore be indirect and roundabout ways to talk about them. For example, a metaphysical

[30] The previous passage is, strictly speaking, false; this, because of Alston (1958) symmetry objection against paraphrases. If original sentence and paraphrase express the same content (or, at least, have the same truth-conditions), how can one accept one and reject the other? And relatedly, how can ontological commitments change by shifting from one to the other –if their content is the same? The easiest way for the Quinean to get out of the tangle is by denying that paraphrases are content-preserving translations, but only weaker "replacement truths" of their originals. This makes it slightly harder to argue in favor of paraphrases for parsimony's sake, as I just did, yet I cannot exclude that this can't be done. For details on this matter, see Keller (2017).

realist who is also a mathematical Platonist could be unimpressed by Hartry Field's "science without numbers" –even if successful– and would fail to see the point of it.[31]

These considerations lend some credibility to the enemies of Quinean metaontology; or, at least, do not fully decide between the two options. The reason why I hesitate to join the ranks of these adversaries of Quinean metaontology is that I consider the alternative to be equally (if not more) problematic. In fact, in implementing metaphysical realism as a rejection of ontological commitment through ineliminable quantification, they are generating too massive a gap between language and reality.
To understand this point, consider that these critics of Quinean standards of ontological commitments have a clear goal in mind: for some Ks, they want to allow antirealism about Ks without having to struggle with error-theory about sentences referring to or quantifying over Ks (this attitude goes as back as to Fine 2001). Viz., by disallowing the reading of one's ontological commitments by observing quantification and reference in one's language, they want to allow antirealists to speak like realists. The simplest example would be the previous passage from Heil, in which he implicitly claims that we should not feel committed to relations even if we normally quantify over them. Another more detailed example appears in Cameron (2008), who pairs this metaontology with mereological nihilism (viz., antirealism about composite objects, namely, objects with proper parts), in order to breed a new kind of nihilist, who is comfortable with truths about composite objects. Mind you, this isn't a move allowed by moving to another artificial language proper to the ontology room, provided with peculiarly homophonic quantifiers –as some others have claimed. This kind of antirealist about tables is claiming that there are tables and what she means by that is exactly what the layman would normally say in a room with tables –only unrestrictedly. For Cameron (2008: 5): "the nihilist is right about the ontology but that the universalist [a brand of non-nihilism] is right about what sentences are true". If this kind of philosopher is ready to accept fairly innocent assumptions such as the Tarskian schema of disquotation, then the first difficulty is that one cannot simply define mereological nihilism as the claim that there are no composite objects –for, according to this position, there are composite objects. The antirealist is simply not committed to them. The layman says "there are eight planets in the solar system", and the nihilist agrees; they are not talking past each other, they are not equivocating on the meaning of "there are" or "planets". They substantially agree that there are planets. This is surely a way to shield extreme philosophical positions (such as mereological nihilism) from those pesky laymen and their pre-theoretical observations, but it also makes for a drastically radical position. These adversaries of Quinan metaontology deny that existential claims express one's true commitments; in fact, some of them (e.g., Schaffer 2009) allow for an almost Carnapian permissivism about existence. As such, they would allow for inferences such as the following. It is true that there are four terrestrial planets in the solar system, so it is true that there are planets, so there are planets. It is true that there is a prime number between 3 and 7, so it is true that there is a number, so there are numbers. These adversaries of Quinean metaontology would all deny that metaphysics has the goal to find out what exists. After all, they would take that to be a very simple enquiry –and one which fails to represent what many (apparently substantial) metaphysical debates are all about: for them, the truth that there is a prime number between 3 and 7 cannot possibly count as a rejection of mathematical nominalism; this would allow the

[31] Field (1980) does not propose "paraphrases" of mathematical claims committing to numbers, rather he aims to prove that true mathematical claims –and the entities they commit to– are not indispensable for science. This still however amounts to an attempt to reformulate physics in a nominalistic fashion.

nominalist to avoid error-theory and resist the need to embark on grandiose nominalization projects such as Field's "science without numbers".
This is of course a way for antirealists to have their cake and eat it too. More generally, this new kind of antirealist is trying to escape what Yablo (2001) called the "predicament of the antirealist" according to which, if there is ineliminable quantification on Ks in a collection of truths T, you are either committed to Ks or you stop accepting the truths T. For Quine there is no sneaking out of this predicament, and everyone who tries to is merely engaging in a deplorable "philosophical double talk, which would repudiate an ontology while enjoying its benefits" (Quine 1960: 223). As intuitive as it sounds, however, this still does not amount to an argument to the conclusion that the ontological commitments to be extracted from Ts have to be detected by observing the quantification domain needed for the truth of Ts.

So far, this is a stalemate, and not one that I can hope to resolve in this thesis. However, I claimed before that this alternative to Quinean metaontology just as, if not more, problematic. How is that? According to it, as the antirealist is allowed to "speak like the realist", realist and antirealist will not be able to detect their ontological disagreement by examining their approach to object-language sentences –but only through meta-language claims which presumably take the form of "I am committed to… whereas you are not committed to…". This generates a gap between theories, languages, and the relative ontological commitments. A metaphysical realist, as it is, might be happy with this result. However, this gap is *just too massive* to be acceptable. Here is why. A popular alternative to Quinean metaontology in these quarters makes a crucial use of the notion of truthmaking –a cross-categorical relation between a linguistic entity (a truthbearer) and something whose existence is needed for its truth (the truthmaker). As we have seen in Chapter 1, truthmaking is a popular tool amongst metaphysical realists; and many have used it to define their notion of ontological commitment, as in Cameron (2008: 4):

> "What are the ontological commitments of a theory? For Quine, it is those things that must be said to lie within the domain of the quantifiers if the sentences of the theory are to be true. I am a truthmaker theorist: I hold that the ontological commitments of a theory are just those things that must exist to make true the sentences of that theory."

The notion of truthmaking in use here is notably *opaque*, in the sense that, for example, "the Taj Mahal exists" may be true even if it is not made true by the Taj Mahal, or by the Taj Mahal existing (Cameron 2008: 6); similarly, it is admissible to have truths about objects moving (e.g., "my train is moving very fast from Pisa to Milan") even if there is nothing moving to make them true –instead, they are made true by motionless things (Heil 2012: 147). The gap between language and reality is here wider than it could ever be. Truthmakers on this theory are intended as extra-linguistic items, as they constitute the bedrock of reality that language is describing. Truthmaking is not, on this theory, entailment of any sort, nor does it involve any form of "picture theory" or "correspondence", as in Heil (2003: 55):

> "Truth making is not entailment. Nor can we explain truth making by a simple correspondence model. If 'a is F' is true, this need not be because there is some entity corresponding to a, some property corresponding to F, and the entity, a, possesses the property F."

Excluding this "correspondence model" is most likely to exclude any form of compositional semantics as relevant for the extraction of ontological commitment from sentences. More generally, there is no *a*

priori discoverable logical or conceptual correlation between *truthbearer* and *truthmaker*: supposing "A" to be a term expressing our truthmaker, perhaps in a metalanguage (what syntactic category A belongs to depends on what kind of entity the truthmaker is, which I do not want to settle for now), and ф to be our truthbearer sentence or proposition, there needn't be any logical or conceptual correlation between A and ф (as explicitly admitted in Heil 2012: 155). Overall, we should not expect truths to faithfully represent, by way of their choice of lexicon or logical form, the reality that underpins them (Dyke 2007). The conclusion is that, for these philosophers, given an arbitrary truth ф, there is nothing that the mere examination of ф can reveal about its truthmakers and the relative ontological commitments.
It becomes harder and harder now to see this result as a victory of the metaphysical realist, and a vindication of the independence of metaphysics over linguistic or conceptual analysis. A common idea is that true sentences are true because, in the intended interpretation, they somehow correctly describe or correspond to reality. Isn't this something the metaphysical realist would want to say? But given this extremely flimsy relation between truthmaker A and truthbearer ф, how is the latter supposed to describe the former? According to this conception, what a true sentence ф expresses, as dictated by compositional semantics, has no bearing whatsoever in the choice of such opaque truthmakers; that is to say, the privileged relation with reality that true sentences enjoy over false ones has nothing to do with what they express. This is an astounding conclusion to reach, as forcefully noted by Schaffer (2008: 9):

> "As to the […] argument that [Quinean metaontology] involves "a wrong turn" through language, I see no way around using language in the theory of ontological commitment. Theories themselves are sentences, and what they commit to *has to be* at least in part a function of what these sentences mean."

Thus, the metaphysical realist might want to fallback. Alternatively, she might decide to go all the way and straight-up deny that we should extract ontological commitments from any theory or language. A completely different method, one that fully realizes the independence of metaphysics, would be the following. Metaphysical positions are "internally" evaluated on the basis of internal coherence, explanatory power, simplicity, elegance, etc… and contrasted to one another on these bases. This makes the whole metaphysical enterprise a matter of internal score-keeping. Truths of the relevant object-language theories have no bearing whatsoever in this enterprise: specifically, which object-language sentences are true, and which model domains are needed for them to be true, is irrelevant. In the end, when metaphysicians will have reached a conclusion (viz., never), we will be in a position to know why, or in virtue of what, the sentences in the theory are true.
This isn't, however, a very inviting picture. A relevant case study, as discussed in Chapter 1, revolves around the occurrence of dispositional terms in microphysics. A metaphysical realist, like me, is sure to be careful to resist the argument that, because a scientific theory, viz., a collection of sentences, describes the fundamental level of reality (if there is such a thing) in almost entirely dispositional terms, then reality itself is fundamentally dispositional. This is suspiciously easy. But the contrary opinion, according to which the abundance of dispositional terms in microphysics has no bearing whatsoever in the resolution of the question of realism for powers, seems equally suspicious. Object-language particle physics most often than not, talks in terms of powers: this must mean something (although what, I am not sure) –it must interact in some way or another with the metaphysical discussion. That metaphysics is an entirely self-contained enterprise, untouched by the theories and conceptual schemes that we come up with to describe reality, is too strong a conclusion even for the metaphysical realist to accept.

3.2 Varieties of alternatives

These are all very general considerations. But which are exactly the alternatives to Quinean metaontology inspired by metaphysical realism? One option is, as we have seen at length, is to use truthmaking to define ontological commitment. To repeat Cameron (2008: 4):

> "What are the ontological commitments of a theory? For Quine, it is those things that must be said to lie within the domain of the quantifiers if the sentences of the theory are to be true. I am a truthmaker theorist: I hold that the ontological commitments of a theory are just those things that must exist to make true the sentences of that theory."

This line of thought has deeper roots in the Australian brand of metaphysical realism; Armstrong (2004: 23-24) claims that the use of truthmakers in metaphysical enquiry, contrasted with the Quinean method of "quantifying over" is preferable to the extent that allows one to perceive ontological commitment to properties expressed by expressions in a predicative position. This doesn't seem a very strong line of argument however, as noted in Schaffer (2008); if one is inclined to be committed to properties expressed by predicate letters, one can always shift to second-order logic to quantify over them; this isn't exactly "Quinean". Nonetheless, as we will see extensively in the next Chapter, David Armstrong extensively deployed truthmaking in the metaphysical debate about dispositions –and was one of the first to do so, when Quinean metaontology was the rule.

A close-knit alternative to truthmaking would be *metaphysical grounding*. Grounding has enjoyed a massive surge of interest in the last decade of metaphysics.[32] Briefly speaking we can characterize grounding as a relation (or an operation) of non-causal or metaphysical determination, usually considered to be obtaining between facts. When we ask "what makes killing wrong?" (or, somewhat more artificially "what makes it the case that killing is wrong?"), we appear to be asking a question about grounding –we are searching for the grounds of the fact that killing is wrong. Whichever these grounds are, they can be taken to be more fundamental facts than the wrongness of killing, as they are what determines or "underpins" it. To the extent that this question and, relative answers, at least partially overlaps the question "why is killing wrong?", grounding allegedly displays an explanatory element as well –in the sense that it provides a peculiar kind of non-causal explanation (we will see more of the relation between grounding and explanation in the next section). Its ties with fundamentality and explanation usually motivate the formal characterization of grounding as a strict partial order; on some assumptions, grounding relations can be taken to generate a fundamentality structure.

For some, paradigmatically Schaffer (2009) the job of metaphysics is not to find out what exists, by examining quantification in some privileged language –but rather to explore this grounding-generated structure of reality. The job of metaphysics is therefore to answer questions such as "what makes it the case that…"; this brand of metaontology accepts all kinds of truth; it accepts that there is a prime number between 3 and 7, that there are eight planets, and so forth… the job of the metaphysician, which will settle the relative debates (about numbers and composite objects) is not to extract ontological commitments from those truths –that would be too easy a job; it is rather to discover what

[32] The literature on grounding, at this point, is massive. I will discuss some of it in the course of the thesis. But, for a useful starting point, see Correia and Schnieder (2012) and Trogdon (2013). Maurin (Forthcoming) offers the briefest and more complete presentation of the orthodoxy about grounding as "an objective and mind independently obtaining hyperintensional and non-monotonic strict partial ordering relation—asymmetric, irreflexive, and transitive—always holding between what is less and what is more fundamental". I will come back to many of these features in due time.

it is, that makes the case that there is a prime number between 3 and 7, and similarly, what it is that makes it the case that there are eight planets. As in Schaffer (2009: 361):

> "Permissivism only concerns the shallow question of what exists. One can and should still be restrictive about the deep question of what is *fundamental*, and one still owes an account of *how* these very many things exist in virtue of what little is fundamental. […] I conclude that contemporary metaphysics, insofar as it has been inspired by the Quinean task, has confused itself with trivialities."

On these view, ontological commitments must be evaluated by looking at the fundamentality structure constructed through the discipline of metaphysics: one is committed to what is fundamental (or, if the structure is not well-founded, what is more fundamental); what is derivative, and depends on it, comes for free, and is thus a "free ontological lunch" over it (Armstrong 1997: 12). This is a way to allow for ontological parsimony without a reduction (since grounding is a strict partial order, it cannot obtain between identical items –see Trogdon (2013). Unlike Quinean metaontology, the admission of some x in the ontology is not considered "parsimonious" or "innocent" in virtue of the deployment of an identity, but because x can be shown to metaphysically depend on something more fundamental.

Finally, I would like to present a reason that lead some metaphysical realists of anti-Quinean sympathies prefer *truthmaking* over *grounding* as their go-to tool in metaontology.

Shortly put, to take grounding as a strict partial order, thus generating a fundamentality structure of reality, may be considered to be too baroque an hypothesis to be acceptable. The universe of the grounding-based metaontologist is a densely populated one, consisting in fundamental items, and derivative, or non-fundamental ones as well. After all, if there are truths about non-fundamental items, and we are free to quantify over them without that having too much of an import, it will still be a universe in which there are tables, rocks, and so forth. Not everything is on the same footing, however –for some things are (more) fundamental, and some others are non-fundamental (or less fundamental). To use Fine's (2001) distinction, this is a universe populated of things that *really*, or *fundamentally*, exist, and others that exist, but do not *really* exist. Of course the friend of grounding will argue that one is only committed to what is found at the bottom, and that everything that is derivative upon it comes for free. However, that the metaphysicians should only be committed to the fundamental items, but not to the non-fundamental ones, seems to be a prescription based on their difference in metaphysical status. And yet, if the former and latter equally exist, what could this difference in metaphysical status ultimately amount to? It would appear that being "non-fundamental" or "less real" (whatever that means), somehow makes for second-hand entities –shadowy beings that count for less in the metaphysician's eye. In the end, the grounding-based metaontology generates a multilayered conception of reality that is shrouded in mystery.

Truthmaking may thus be seen as a way to avoid this difficulty, while preserving the intuition that the job of metaphysics is not just to extract commitments from quantification in a sentence, but to discover the "deep story" about it. Suppose that, given an arbitrary table, it is the case that it is round. You may also think that, if there is a fundamentality structure involving objects or facts, tables and the facts about them are not to be found exactly at the bottom of it. Presumably, the fact that the table is round is grounded by facts concerning its parts, maybe mereological atoms, maybe not, being so-and-so arranged. Thus, according to a grounding-based metaontology, you are committed to the parts, and perhaps their arrangement –but, quite problematically, on the other end of the grounding relation, you also have this multitude of "shadowy entities" such as the table itself.

Here is the alternative provided by truthmaking. Because truthmaking is opaque (in the way explained above) the truthmaker for "the table is round" will not necessarily be the table, or the table being round, or anything of that sort. In fact, truthmaker theorists will say that the truthmakers are the parts of the table, arranged in such-and-such a way, or something of that sort. Such truthmakers are the only items to which she is committed by accepting that the table is round. What about the table? From "the table is round" follows that "there is a table"; however none of those sentences have tables as truthmakers, so tables are not awarded any metaphysical status whatsoever, "fundamental" or "derivative" as it might be. Truthmaker theorists have no need to engage in any distinction between "fundamental" and "non-fundamental" items; there are no such layers in reality and in the items that function as truthmakers. Another way of saying it, as in Heil (2012: 165) would be that the distinction between fundamental and non-fundamental truthmakers is unwelcomed, and that "the fundamental truthmakers *are* the truthmakers". In a similar deflationary note, Ross Cameron writes:

> "The distinction between mere existence and real existence is just a way of talking. The rules of the language are that 'a really (or fundamentally) exists' is true iff a is an element of our ontology (read: iff a does some truthmaking); that 'a exists' is true iff <a exists> is made true by some thing(s); and that 'a merely (or derivatively) exists' is true iff <a exists> is made true but isn't made true by a. Stripped of any worrying metaphysical overtones, the distinction between real and mere existence (or, equivalently, fundamental and derivative existence) should not cause us unease."[33]

All in all, someone who doesn't like to read the ontology off from language, and doesn't want a multilayered conception of reality either, may decide to opt for truthmaking as an alternative to both Quinean metaontology and a grounding-based conception.

3.3 My approach

We have seen three metaontological stances that a metaphysical realist might endorse; the first one, Quinean metaontology, functions by extracting ontological commitments through existential quantification in a privileged subset of sentences. The second one suggests to only be committed to what needs to exist for those sentences to be true, viz. their truthmakers. Finally, according to the third stance, the goal of metaphysics is to discover an alleged fundamentality structure of reality, generated by grounding relations: what we are committed to, is found at the bottom (if there is one).

All in all, the set-up that I prefer is closer to Quinean metaontology than the aforementioned alternatives. The first reason is the one detailed above: these alternatives are in fact just as, if not more, problematic, for they generate too massive a gap between language and reality. The second reason is closely related to the first. Unlike its alternatives Quinean metaontology provides a clear methodology that assigns the philosopher a clear, albeit fallible, role. Take, for example, truthmaking-based metaontology in which truthmaking is opaque (in the ways seen before). There is no way to know, *a priori*, from the metaphysician's armchair, which the truthmakers are for any given sentence. This seems, at best, a job for scientific enquiry which will eventually discover the "deep story" about it (as explicitly admitted in Heil 2012: 155). Someone might take this to be an enviable position to be in. I do not. For according to this position, the job of searching for ontological commitments is entirely out of the philosopher's hands. That is to say, it is not the metaphysician that does metaphysics –but the scientist instead. This is not a framework I am comfortable with (relatedly, one could wonder how can

[33] Cameron (2008: 7). Relatedly, the reader can also consult see Azzouni (2012), and, more extensively, Heil (Forthcoming).

Heil, a power realist, claim to be committed to powers, given that, according to his own position, he cannot *a priori* claim that there are dispositional truthmakers). The Quinean metaontologist is in a far better position, given that she is allowed to extract ontological commitments from sentences –surely, the constant threat dangles upon her head that the set of sentences she is working with is the *wrong* one, and that, down the line, she will need to reconsider her commitments. But a metaontology that allows the philosopher to fail is better than a metaontology that doesn't allow the philosopher to do anything at all.

This is not to say that the problems highlighted in Quinean metaontology have been magically resolved. They are still there. The moral of the previous section, I believe, is that the metaphysical realist who adopts Quinean metaontology has to strike a delicate balance: for she must extract ontological commitments from quantification in a set of privileged sentences, while at the same time being conscious that there is no certainty that any set of privileged sentences faithfully mirrors reality –and, even if there was, she would be in no position to know which one. This is something that, in my opinion, the metaphysical realist employing Quinean metaontology must learn to live with.

Additionally, one should keep in mind that in employing Quinean metaontology, I do not repudiate grounding and truthmaking as useful items in the metaphysician toolkit. In fact, I think they are very important. I will use them extensively in the due course of this thesis. My methodology is here that of Rosen (2010: 110):

> "I make this proposal in an experimental spirit. Let us see how things look if we relax our antiseptic scruples for a moment and admit the idioms of metaphysical dependence into our official lexicon […] If this only muddies the waters, nothing is lost; we can always retrench. If something is gained, however, as I believe it is, we may find ourselves in a position to make some progress."

Therefore, in the following I will assume that talk of grounding is not meaningless and not completely equivocal (albeit perhaps not univocal); I will not argue *for* grounding, nor I will argue that grounding has a privileged position in the discipline of metaphysics –I will rather *use* grounding, and see where that leads us. In the next section we will see exactly how grounding can make itself useful. Relatedly, in exploring the question of realism for powers, in Chapter 3, we will see how different friends of powers have different metaontological stances; we need all of the previous options on the table to understand how the debate has been formulated so far.

Overall, the goal of this thesis is not to defend Quinean metaontology; it's to clarify the position of the friend of powers. Therefore, even if I take Quinean metaontology to be preferable, for the reasons detailed above, I will take into serious consideration both grounding and truthmaking talk –and their applications in metaontology. My approach, broadly speaking, is that of employing Quinean metaontology with an open eye; just as I assumed metaphysical realism with an open eye.

8. Hyperintensionality and explanation

One of the reasons grounding is considered to be a very useful tool, is that it allows for very fine-grained distinctions –at least, finer-grained than modality. What do I mean by that? Grounding locutions generated hyperintensional contexts in sentences, viz., failure of substitituvity *salva veritate* of intensional equivalents. Any relation that does so, I will call an "hyperintensional relation", even if, strictly speaking, hyperintensionality is merely a feature of sentences. If a relation generates intensional contexts in a sentence (viz., failure of substitutivity *salva veritate* of extensional equivalents), I will call it an "intensional relation"; an intensional but not hyperintensional relation is a "merely intensional"

relation. A relation that is neither hyperintensional nor intensional I call "extensional relation"; extensional relations give us freedom to substitute *salva veritate* extensional equivalents.

As I introduced it, grounding is a relation of non-causal determination (standardly, a strict partial order) that occurs between facts; grounding locutions will take the following form: "the fact that ϕ grounds the fact that ψ", or "that ϕ makes it the case that ψ", where ϕ and ψ are formulas for that-clauses to individuate facts. Here is an example of grounding generating hyperintensional contexts (borrowing from Fine (1994) –that, although did not deal in *grounding*, was a seminal paper on hyperintensionality). Consider "Socrates exists" and "{Socrates} exists"; they are necessarily equivalent in the sense that, assuming sets to necessarily exist (or at least existing whenever their members exist), it is impossible for Socrates to exist without its singleton also existing –and vice versa. However, it would seem "that Socrates exists makes it the case that {Socrates} exists" is true, while "that {Socrates} exists makes it the case that Socrates exists" is false. In fact, although Socrates and its singleton are necessary co-existents, the existence of the latter depends on the former, but not vice versa; Socrates carries the "ontological oomph!" over its singleton, and not the other way round. This implies that grounding, as a relation of metaphysical dependence, cannot be defined modally –as a relation of modal dependence, or through supervenience. A modal definition of *dependence* (or of *essence*, as it was Fine's original point) is not fine-grained enough to discern that the singleton of Socrates depends on Socrates, and not vice versa (Does this whole argument for the hyperintensionality of grounding rest on the assumption that sets depend on their members? No. The point would still remain if one was to assume, contrariwise, that members depend on sets: the example would just be reversed. The point is simply that dependence involves an asymmetry and a direction that modality may not able to reconstruct).

This kind of reasoning contrasts grounding favorably with respect to modal notions, which generate more coarse-grained definition. Thus, I do not reject modal definitions only because I do not like modal magic (as in the previous section), but because they are occasionally too blunt an instrument to get things right. Probably the clearest anomaly that reveals the inefficacy of so many modal definitions are counterexamples involving necessities. For example, the necessary co-existence of Socrates and {Socrates} stops us from detecting the dependence of one over the other with merely modal tools. Here is another example; let us define a notion of existential dependence between items in modal terms as follows "A depends on B iff, necessarily, if A exists, then B exists as well" (this is what is sometimes called rigid existential dependence); however, if there is a necessary being, putting it in the B-position makes any arbitrary A depend on it. But this is too strong a conclusion; think about a mathematical Platonist, who admits the existence of the number 2 as a necessary being. Using the previous definition would make everything existentially depend on the number 2. So clearly modal dependence is too blunt an instrument to detect what really depends on number 2 and what doesn't. A third example involves the modal definition of intrinsicness as in Lewis and Langton (1998), according to which, roughly speaking: "an intrinsic property can be had by a thing whether it is lonely or whether it is accompanied"; on their account, "accompaniment" is coexistence with a *contingent* object distinct from itself', whereas loneliness is its negation. As the authors however realize, there is a difficulty hidden in that definition; for suppose that there is a (necessary) God who created the universe. *Being created by God* would appear to be an extrinsic property –one that depends on the relation of *being created* that everything entertains with God; however, given their definition, is actually intrinsic; given that God is not a contingent object, its existence does not count in making someone accompanied. Therefore, an object is "lonely" if it is the only creation of God –thus making the property *being created by God* an intrinsic one: in fact, it can be possessed whether something is the only creation of God, or not. What if one strikes out "contingent" in the definition of "accompaniment"? Then everything is always

accompanied by God, no object can ever be lonely, and no property instance can ever be intrinsic. These examples purport to show that there is a family of dependence relations in metaphysics that cannot be defined in modal terms (the case of intrinsicness falls in this category once we see that intrinsicness, as preliminarily characterized by Lewis and Langton, surely involves a dependence relation: an intrinsic property is one that can be possessed *independently* from whether there are any other contingent beings –it only depends on how the object possessing it is).

In my opinion, the detection of hyperintensional distinctions, and contrariwise the coarseness of intensional ones, was a success and an objective step forward in contemporary philosophical theorizing; but what does it mean for the background metaphysics? Is the world really as fine-grained as grounding or metaphysical dependence locutions would suggest? Let me offer some considerations.

First of all, a metaphysical realist may be tempted to think that metaphysical dependence relations provide reality with a fine grain. After all, that there are metaphysically genuine hyperintensional phenomena doesn't seem too far-fetched an hypothesis; for example, *triangularity* and *trilaterality* are necessarily coextensive properties, in the sense that necessarily, everything that has three angles also has three sides, and vice versa; and yet *triangularity* and *trilaterality* may reasonably be considered two numerically distinct properties –and not just two different conceptualizations of the same property. Hyperintensionality as a genuinely metaphysical phenomenon has recently received a veritable manifesto in Nolan (2014), who proposes something along the lines of an "optimist meta-induction" in favor of what he calls "hyperintensional metaphysics", based on the historical consideration that the extensionalists of old were in the long run unsuccessful in their projects: if philosophers were wrong to resist the intentional revolution, they are also wrong now to resist the hyperintensional revolution. Although I am not sure what this "induction" would prove[34], an hyperintensional revolution is already happening: discussions about paradigmatically metaphysical notions such as *ontological* and *metaphysical dependence*, *reduction*, *essence*, *structure* etc… are now subject to what we may call, rephrasing Fine (2005: 9), a "more-than-modal mania", in the sense that they are often said to be non-analyzable in merely modal, or intensional, terms.

Although Nolan (2014) doesn't offer any decisive consideration in favor of hyperintensionality being a genuinely metaphysical phenomenon, I am open to the idea of that being the case. Nonetheless, there is an argument to be made to the contrary conclusion. The rough idea is that hyperintensionality, in many cases, has an "epistemic" or "representational" source: this is the case, most clearly, when it comes to patently epistemic phenomena such as belief and knowledge. One may believe, or know, that Batman fights crime, without also believing that Bruce Wayne fights crime, even if "Batman" and "Bruce Wayne" are co-intensional equivalents. That hyperintensionality here has an epistemic or representational source is quite clear: for my failure in believing (or knowing) that Bruce Wayne also fights crime has merely to do with inherently human limitations regarding the intensions we have access to. There is nothing in the previous example that should lead us to believe that there is an objective finer-grained distinction between Batman and Bruce Wayne that their (necessary) identity fails to carve.

It is however harder to generalize to the conclusion that hyperintensionality always has an epistemic or representantional source –this is still no argument *contra* objective hyperintensionality. Grounding may on the contrary provide objective reality with extremely fine-grained distinctions that we could never pick up utilizing modal resources alone.

However, a reason to believe that the hyperintensionality provided by grounding and dependence locution is not objective, comes by considering the strict relation between grounding and explanation. As introduced before, grounding is supposed to provide a peculiar kind of explanation sometimes

[34] Also, I am not sure how legitimate it is to generalize and "induce" from a single historical precedent.

called *metaphysical explanation*: grounding relations (or operations) is supposed to back phrases such as "because" or "in virtue of" (e.g., as seen before, the Euthyphro dilemma). When grounding was first explicitly introduced in the literature, it was sometimes claimed that grounding relations were themselves directly explanatory, or that grounding was an explanatory relation (e.g., Fine 2001: 15). Similarly, in Fine (2012: 38, emphasis mine):

> "In addition to the modal connection, there would also appear to be an *explanatory* or *determinative* connection – a movement, so to speak, from antecedent to consequent; and what is most distinctive about the in-virtue-of claims is this element of movement or determination."

Many alleged features of grounding are introduced on the assumption that grounding is an explanatory relation; first and foremost, its mathematical feature of being a strict partial order. Hyperintensionality might be another. However, if grounding inherits hyperintensionality *via* its intimacy with explanation (e.g., Kim 1993: 167, Schaffer 2009: 364), this may suggest that this hyperintensionality in fact has a non-objective and merely representational source. In short, this is why: grounding, as an objective relation between facts, cannot be identical with an epistemic (and hyperintensional) relation of explanation; but if the two are distinct (like causal and causally explanatory relations) there is hardly any reason to believe that grounding itself is hyperintensional; what remains is the hyperintensionality of explanation, which has an epistemic or representational source.

Now, for some details. First of all, explanation is hyperintensional, and the source if this hyperintensionality is merely representational or epistemic in character. Because explanation is tied to our states of understanding, or conversely ignorance, it is susceptible to difference in descriptions or modes of presentations –in short, explanation is susceptible to content, which is notably hyperintensional. Some pieces of content provide understanding, or demand elucidation, while some others do not. About causal explanation, Mumford writes that

> "[i]f A causes B, it does so no matter A is described (and no matter how B is described); but for description α of A to be part of an informative causal explanation of B, under description β, the intensions or meanings of α and β are relevant in that they fix their referents by picking them out in a certain way, by a certain mode of presentation. […] Nothing about ontology is at stake in questions of explanation for explanatory success is contingent upon the modes of presentation of *explanans* and *explananda* and relative stages of knowledge and ignorance."[35]

To be honest, I find the claim that "nothing about ontology is at stake in questions of explanation" to be unnecessarily strong –but I agree that "explanatory success is contingent upon the modes of presentation of *explanans* and *explananda* and relative stages of knowledge and ignorance". Insofar as it is tied to difference in content or modes of presentation, the hyperintensionality of explanation is inherently representational in character (as also claimed in Thompson 2016).

Now, what about the hyperintensionality allegedly provided by grounding? As recent literature has made abundantly clear, grounding lives a peculiarly problematic "double life" (Raven 2012: 689). Fine

[35] Mumford (1998: 140). Incidentally, this difference in grain between causal and explanatory relations was offered as a reply to the so-called *virtus dormitiva* objection against powers (see Chapter 1). It is, in my opinion, a robust counter objection; if the goal of the objection is to show that powers cannot be causally relevant, as they produce trivial explanations, one can easily answer that, insofar as we pick and conceptualize powers in terms of their causal roles, a trivial or uninformative explanation could indeed be backed by a genuine causal relation; e.g., it could still be the case that the cause of A caused A, even if that does not amount to a genuine explanation.

(2012: 38) claimed that grounding provides a more-than-modal direction that is either "determinative" or "explanatory". But how can it be both? In short, how can grounding itself, as a metaphysical relation of non-causal determination, be an explanatory relation? The trouble seems to be that grounding is purported to be an objective relation holding between facts independently from any mental or linguistic activity; whereas explanation, as claimed, clearly displays an epistemic character. Thus the two relations can hardly be thought as one and the same –if they want to retain their defining features. An alternative may be that grounding and metaphysical explanation are two distinct kinds of relations that runs parallel, in much the same way in which causal explanation tracks down and carves causal relations; this fits the bill of what Kim (1994: 57) calls "explanatory realism", that is to say, the idea that "some objective relation between the events underlies, or grounds, the explanatory relation". Therefore, some event's causes causally explain it because it happens in virtue of them; and similarly, some fact's grounds metaphysically explain it because the former obtains in virtue of the latter: ground grounds explanation –or so the thought goes. However, on this view, there is no reason to think that grounding is itself hyperintensional; much in the same way there is no reason to think that causation is as fine-grained as causal explanation.[36] Incidentally, that there was a difference in grain between the latter two relations was Mumford's original point.

Summarizing, although grounding locutions generate hyperintensional contexts in sentences, we shouldn't be led to think that reality itself is finer-grained than modality. This is not to say that there is no prospect for an "hyperintensional metaphysics" as envisioned by Nolan (2014), but only that grounding fails to support it. All in all, this issue is too big for me to entirely tackle in this thesis. However, as we will see in the last Chapter, whether hyperintensionality is a genuinely objective phenomenon is of *crucial* importance when it comes to the question of realism for powers; thus, I will rest content with highlighting this (so far, ignored) interaction between the objectivity of hyperintensionality and power realism.

9. The elements of reality

5.1 Objects

In the course of this thesis I usually employ the terms "thing", "entity", or "item" as the most general and topic-neutral sortals; that is to say, as transcendental categories that apply to everything I quantify over or refer to. As I use these terms, calling something a "thing" or an "item" does not provide any substantial qualification. Therefore my use of the word "thing" is different from the one in Lowe (1998) according to which something is not a thing. I reserve the expression "individual" to something that warrants *individuation*, viz., something with an individual essence, even as trivial as an individuality of the logical form "being identical to a", where "a" is a constant; and I won't use this term unless the issue of metaphysical individuation is explicitly discussed (as in Chapter 7). A "particular" is, well, a particular, as opposed to a universal, and again I won't use this term unless the opposition between particulars and universals is relevant. Then we get to the word "object"; in general I use "object" as shorthand for "material object", in the sense of something occupying a region of space-time (thus, I won't use the term "abstract object", but rather "abstract thing", or "abstract item").

I assume, as in the "ordinary view" of the world introduced in Chapter 1, that the objective reality which we inhabit, and which we are part of, consists, amongst other things, of objects. I will not argue

[36] For this parallelism between causation and grounding, see Wilson (Forthcoming), who would go as far so as to claim that grounding is but "metaphysical causation". For this "separatist" view about *grounding* and *causation*, see Wilson (2014) and Bernstein (2016), Maurin (Forthcoming).

for this assumption (for a defence of some material objects, the ordinary ones like trees and cars, see Korman 2015). The reason is simple: that the world consists, amongst other things, of objects, is one of the methodological assumptions over which I will discuss the introduction of powers. In the course of the discussion, I will not prioritize microscopic objects as opposed to the macroscopic ones that we meet in our everyday lives: this is a deliberate choice, whose goal is to avoid potential ambiguities in the discussion. In order to see why, allow me to present what I like to call "the Cow Test" –a semi-serious test to evaluate examples in metaphysics papers. Suppose that you are writing a metaphysics paper, and you are formulating an example, perhaps an instance of a general thesis, or a counterexample to one; suppose that you have begun to write it as being about subatomic particles: perhaps you have a muon with -1e, and an antimuon with +1e. The topic of your paper, mind you, hasn't specifically to do with subatomic particles or their very peculiar features: perhaps it's about unrestricted composition, or the growing block theory, or what have you. The Cow Test is the following: try to re-write your example, but instead of subatomic particles, let it be about cows; perhaps instead of the muon you have a black cow, and instead of the antimuon you have a white cow. Does the example still work? If so, I would advise you to drop the muons and use the cows. If it doesn't work, you should make it explicit since the beginning that you are relying on specific assumptions about subatomic particles in order to make your point.

The moral behind this test is the following: the needless use of examples drawn from microphysics can bog down the discussion in unnecessarily complex details. Sometimes these unnecessarily complex details still get the science fundamentally wrong, as Ladyman and Ross (2007: 24ff) notoriously protested. I, for myself, can't really tell –since I have no extensive scientific background. But I suspect that at least some philosophers use such example to make their papers sound more "scientific" that they otherwise would. Furthermore, if the microphysics example spins idly with respect to the rest of the paper, then its addition is but complexity for complexity's sake.

In what follows, as I claimed, I will evaluate the introduction of powers over the background of an ordinary worldview of objects and properties, under the broad assumption of metaphysical realism. That's the only background over which I am comfortable enough to work. To avoid any possible source of confusion, and to strip away any unwarranted presumption of "scientificity", I have applied the Cow Test to the whole thesis. Thus, I will most often than not speak of cows and tables and rocks, instead of muons and antimuons. If not, and when not, I will make it explicitly clear which the assumptions are at play. For one, a context in which talk of fundamental particles may be warranted, revolves around the characterization of the question of realism for powers as an issue of fundamentality: e.g., Bird (2007a) claims that some fundamental properties are essentially dispositional in character, thus allowing for the possibility that none of the paradigmatic examples to be found in the macroscopic world (e.g., solubility, fragility, elasticity…) are genuine powers. This is not a move to which the power realist with a *penchant* for fundamentality is forced (powers may be fundamental, but they might also be non-fundamental); however, was that to be the case, one shouldn't restrict one's attention to cows and tables, since this brand of realist will admit that such things possess no powers.

5.2 Properties

As I briefly claimed in Chapter 1, a theory of powers is a theory of properties, or something in the vicinity thereof. What is the exact relation between powers and properties, then? Do we need to be realists about properties to be realists about powers? And if so, does realism about powers presuppose some metaphysical stance about properties as well?

Those are complicated questions to answer; for now, I can say that a great number of participants in the literature about powers, both realists and antirealists, appear to be property realists, in some way or another. Martin (1980, 2008), Heil (2003, 2010), and Molnar (2003) are all trope theorists, although the first two would probably reject the word "trope" to refer to particularized modes or ways of being, as they feel it to be too intertwined to Williams' (1953) one-category bundle-theory (they would rather reconnect to Locke's two-category ontology). All in all, David Armstrong can be called an Aristotelian (mostly in Armstrong 1978). Bird (2007a) is unapologetically Platonist, like Tugby (2013). Ellis (2001) appears to be a universalist of some kind. Stephen Mumford never explicitly provided a specific account for his theory of properties, yet he always seemed confident with talk of properties, and occasionally, universals as well (Mumford 2004). In general, universals appear to be quite popular amongst friends of powers. Lowe (2006) embraces both universals and particularized properties.

In general, it seems that a great number of debates in power ontology literature are largely independent from our stance on what we take properties to be. For Armstrong (2005: 309) whether properties are dispositional or non-dispositional, and whether they are universals or particulars, are issues "largely independent of each other" –although Tugby (2013) suggests an interesting intersection between specific issues of power ontology and the choice between universalism and trope theory.

As for the possibility of combining nominalism (viz., the antirealist claim that there are no properties) with a theory of causal powers, there is a strongly reductionist nuance to Shoemaker's (1980) claim that properties are just exhausted by powers –a nuance he himself rejected later on (Shoemaker 1998: 64), given that, in his eyes, one would still need properties to explain what powers are. Mumford (2004) follows in his footsteps keeping properties, while Whittle (2009) walks down the road of a nominalist account of causal powers. It may not be irrelevant to note that Whittle's account looks like an account without causal powers at all (she herself likens her view to Ryle's ticket-to-inference view, one of the most notorious "foe of powers"). However, given that, as far as I know, Whittle's account of powers is the only explicitly nominalistic one (even Lewis' 1997 reductive account mentions properties) it is difficult to extract some lesson from it.

In what follows I will quantify over and refer to properties; however, unless otherwise specified, when I will speak of object having properties, I will mean it in a somewhat deflationary fashion, in the sense that there are true predications about them; more specifically, when I will speak of object a having property P, I will mean that "a is P" is true. That this sense of property is deflationary can be immediately observed by noticing that the truth of "a is P" –that it is the case that a is P– is no evidence enough to settle the matter between property realists and nominalists. I suspect that many uses of properties in metaphysical debates are similarly deflationary; first and foremost, Lewisian set-theoretic abundant properties. Similarly, it's possible that Bird's (2016) distinction between "ontic" and "predicative" properties can be applied here –although a full investigation on this matter would sidetrack us too much.[37]

This is not to say all positions in the metaphysics of properties are on even odds. On the contrary, it is very much likely that, down the line, some property-talk in the debate about powers will not be so easily paraphrased by the nominalist. I suspect that this might happen in the characterization of realism about powers as a claim about the *nature* of properties, e.g., when it is claimed by the so called "dispositional essentialists" (e.g., Bird 2007a), that some properties have a dispositional nature. But I

[37] As we will extensively see in Chapter 3, some power-talk can also be systematized in this fashion, and can be shown to be, to some extent, ontologically innocent. In fact, it is very much open to the neo-Humean foe of powers to claim that things are so-and-so disposed; after all, it is true that gold is malleable and that the rubber band in my hand is elastic. This is patently *not* what the debate on the reality of powers is about.

have no strong argument to this conclusion. In short, I tentatively share the optimism of Mellor (1974: 157) that all property-talk in the debate about powers can be paraphrased in a nominalistically kosher fashion. If this is not possible, this might be another line of thought to pursue –for another time.
Similarly, like many friends of powers, I will not endorse a specific theory of properties from the get-go, although I will be forced to express some preference in due time; e.g. in Chapter 6 I will offer what I hope to be convincing motivation to take the manifestations of powers to be property universals.

5.3 Facts

Another metaphysical category needed in what follows is that of *facts*. I allow talk of facts for the simplicity it provides in the discussion. Facts are usually expressed by way of closed formulas and introduced through that-clauses; in principle, I do not put any restriction of logical complexity. Therefore, we have the fact that Socrates runs, the fact that someone runs, and the fact that Socrates runs and the sky is blue.
My metaphysics of facts is cookie-cutter. Facts corresponding to atomic formulas can be taken to be a compound of an object and a property –although famously it is not a "mereological" kind of composition in the sense that it violates both principles of unrestricted and unique composition. Because I take facts to have this kind of internal structure, it naturally comes the thought that, having allowed facts of arbitrary logical complexity, in general more complex facts will have more structure than the simpler ones. I will not investigate what kind of composition or structure is needed here, nor I will settle matters of metaphysical priority between objects and properties, on the one hand, and facts on the other.
Facts can be taken, for simplicity purposes, to be truthmakers of the correspondent sentences; and to be *relata* in instances of grounding. Although this is the orthodoxy, there appear to be a number of counterexamples to it. My conception of facts is liberal enough to accommodate all of them.
First of all, occasionally there is talk of properties, or powers, being truthmakers themselves. However, in this thesis this is a shorthand for saying that the truthmaker is a fact involving that property or power (thus, it will be more precise for an antirealist about powers to claim that, e.g., "all dispositional facts are grounded in categorical facts"). Secondly, what about the truthmakers for existential sentences of, e.g., "Socrates exists"? A very common assumption is that there is no real non-logical property of existence; it would rather seem that the truthmaker of "Socrates exists" is Socrates himself. However, as I claim, I accept facts of arbitrary logical complexity; this is already sufficient to prove, on reasonable assumptions, that not *all* facts involve objects having properties (e.g., unless one accept a substitutional interpretation of quantifiers, "the fact that someone runs" involves no object whatsoever). Therefore, there is nothing wrong, in my position, to claim that "Socrates exists" is made true by the fact that Socrates exists (whether existence is accepted as predicate or defined through existential quantification and identity, at this point, doesn't matter).
Something similar goes for grounding; although grounding is usually said to obtain between facts, sometimes it is considered to be a cross-categorical relation (e.g., Schaffer 2009). Sometimes it makes sense to think of objects themselves, or their existence, as grounding or being grounded, for instance if we want to consider *constitution* as a grounding relation (Audi 2012: 106), or perhaps composition as a grounding relation (Cameron 2014). I can accept the claim that the statue is constituted/grounded by the lump of clay in the sense that the fact that the former exists is grounded in the fact that the latter exists –whatever the logical form of those facts might be. Furthermore, those facts may or may not involve objects having properties. And something similar goes for the composition case (I point out that I am not committed to neither claim about constitution or composition).

A final sense in which my take on facts is quite liberal is that I also allow for facts involving not an object having a property, but two or more objects standing in a relation. Thus, those facts are composed by both objects and relations. And it is to relations that I now turn to.

5.4 Relatedness and extrinsicness

Worries about the existence of relations run deep in the history of philosophy. However, metaphysicians nowadays speak quite casually of things being so and so related; furthermore, many metaphysical theories appear to be committed to a number of relations used in their formulations: identity, parthood, the determinate/determinable relation, supervenience, reduction, grounding (on some formulations), all manners of causal and explanatory relations, and so forth. As we will see, relations play an important part in our quest for dispositionality as well, since a candidate is the so-called *dispositional directionality*, a relation that pairs each power to its manifestation(s).

Perhaps this change in attitude regarding relations is due to the widespread "founding myth" of analytic philosophy, according to which Russell and Moore successfully defended external relations against the monist arguments of Bradley and other British neo-Hegelians (as critically discussed in Schaffer 2010) However, it appears to me that a simpler reasons why relations are now commonly accepted by philosophers is that we are used to employ first-order predicate logic with polyadic predicates. As a metaphysical realist, fully convinced of the independence of reality from the formalizations that we concoct to depict it, I take this is to be a bad reasons for accepting relations; for one thing are polyadic predicates, and another are relations: after all, we might deploy polyadic predicates to fully describe a world without relations.

In this thesis I will not discuss any arguments for nor against the existence of (external, irreducible) relations. For simplicity, I assume that there are. This allows to me to speak quite freely of a number of metaphilosophical relations such as identity, grounding, etc… which will significantly streamline the formulation of a number of positions. Mind you, however, that the existence of (external, irreducible) relations is not a completely orthogonal issue to powers; as I claimed in Chapter 1, one of my worries is whether a relational ontology of powers might end up being *too* relational –thus destroying our ordinary view of the world as consisting of objects instantiating monadic, and presumably intrinsic properties (that being said, I take no issues with relations *per se*). Additionally, many of those who reject dispositional directionality, as we will see, are occasionally suspicious of relations in general; I will make it explicitly clear when it is the case.

There is however something more to add about relations and relatedness itself. I argued that a metaphysical realist should be quite careful in treating the presence of polyadic predicates in a sentence as a sure-fire indicator that we are dealing with relations; this however makes it difficult to characterize *relatedness*. Usually relations are opposed to "monadic" properties –that is to say, properties with only "one place", rather than two or more. But that is a syntactic feature of predicates and formulas –not of properties, nor relations. This didn't stop philosophers from offering a syntactic characterization of relatedness, as Quine (1960: 106) did in the discussion about identity:

> "What makes identity a relation, and "=" a relative term, is that "=" goes between distinct occurrences of singular terms, same or distinct, and not that it relates distinct objects."

A metaphysically more substantial idea, albeit a vague one, is one according to which a relation does not merely qualifies one or more entities, but provides some kind of "bridge" or "arc" that connects

them. To claim that "David is the father of Solomon", which presumably involves the relation *being the father of*, is not merely to characterize David as a father –or, conversely Solomon as a son– (what are sometimes called "relational properties"), but to characterize David as the father of Solomon, and Solomon as the son of David. Through the mention of the one entity in the description of the property of the other, relatedness is creeping back in. Massimo Mugnai had a simple yet powerful way to visualize the problem of relations in Scholastics metaphysics: put all the fathers on the one side, and all the sons on the other (never mind the fact that all fathers are sons, and some sons are fathers), and it still remains open whose father –and whose son– everyone is. One still has to connect each father to his own son, and vice versa.

This suggests a number of criteria for relatedness. E.g., Russell (1903: 224) suggests that whenever a predicate involves an expression with a referential role, referring to something numerically different from its bearer, then we have between our hands a relational predication or "an adjective which is relative"; which, in his words, is "merely a cumbrous way of describing a relation". If this is still too close to a characterization of relational predicates, rather than relations themselves, here is another, metaphysical criterion, instead of a semantic one, proposed in Cover and Hawthorne (1999: 68):

> C&H) F is a relation if and only if it is not possible that both (i) there exists some entity x that is F and (ii) there exists no y distinct from x.

There are many problems with C&H, and, for it to work, we will need to put some real elbow grease into it. However, it has its virtues. First of all, as a metaphysical criterion for relatedness, it is entailed by the previous, semantic, one: in fact, in every world in which a predicate is correctly ascribed to some x, if the predication involves a term with a referential function, referring to some y numerically distinct from x, the operation of referring must be successful; thus in every such world there is an y distinct from x. Additionally, C&H fits well with some "metaphysical" criteria for the arity of a property or relation. Wehmeier (2012: 768) proposes the following:

> "The arity of R is the maximal number of objects that can possibly be related by R."

Keep in mind that, however, that Wehmeier's criterion can only function as a definition of arity, and not relatedness, since relatedness appears in the *definiens*. As such, it is also incapable to measure the arity of a monadic property (even if that is always 1). Wehmeier's criterion can be generalized in the following way, utilizing facts as introduced in the previous section:

> W_G) The arity of a property or relation F is the maximal number of objects that can possibly compose a fact together with F

One can see how easily W_G and C&H fit together: whenever the maximal number of objects that can possibly compose a fact together with F is more than one, then both (i) and (ii) obtain, and F is a relation. The other way round: if (i) and (ii) obtain, the arity of F according to W_G is more than 1. Thus, relations are properties with arity higher that 1, as originally intended.

This interconnected family of criteria for arity and relatedness, overall, suffers from two problems; the first one is that they are modal –and, as I have explained at length, this is potentially problematic. For example, C&H has several counterexamples in the form of necessary beings; for if there is at least one, all properties are relations, for (ii) is impossible. If the arity of the relation was to be calculated based on

the number of entities that have to exist for the relation to hold (as suggested by Molnar 2003: 42) –in the sense that they necessarily exist whenever the relation is instantiated, every necessary being would pump up the arity of any relation by 1. This can generate spectacularly unacceptable results; for example, a mathematical Platonist who believes in numbers as necessary beings, and who also accepts C&H, plus this criterion for arity, would conclude that every property is actually a relation with infinite arity. W_G is not so susceptible, since the objects that count for arity are only the ones involved in a relation instance –it isn't enough that they exist: they have to be involved in the instance; however, given the existence of a necessary being, e.g., God, it would be the case that all properties are actually relations (given C&H), even if the arity of some of them is just 1 (according to W_G). As I see it, the existence of relations of arity 1 is another spectacularly unacceptable result.
The first and easiest way out of this tangle is to modify the (ii) condition in C&H as a criterion for relatedness so as to exclude irrelevant necessary beings. For example:

> $C\&H_1$) F is a relation if and only if it is not possible that both (i) there exists some entity x that is F and (ii) there exists no y distinct from x *that, together with x and F, composes a fact*

This is supposed to solve the problem posed by necessary beings such as, say, God. The original problem was, say, that C&H would make the property *being red* relational, under the assumption that God exists necessarily: in fact, it is not possible that there exists some x that is red, without there also being something distinct from x (viz., God). But on $C\&H_1$ the existence of God falsifies (ii), as God does not compose a fact with x and the property *being red*. Or so the idea goes. Unfortunately, $C\&H_1$ still get things wrong, for the very simple fact that, given my liberal notion of fact, God indeed composes facts with our arbitrary x and the property *being red*. After all, if we have the true sentence "the ball is red and God is good", with a logically complex fact as a truthmaker, we can see that the ball, *being red*, and God (amongst other things) compose a fact. This would turn the property *being red* relational (assuming, an instance of $C\&H_1$, with the ball as the value of x, and God as the value of y). So one might further decide to work on $C\&H_1$ by putting further constraints in (ii): the point that it wanted to convey is that y must not enter in an instance of F with x, for x not to be a relation. So we might want to put the further constraint in (ii) that y does not, together with x and F, compose an atomic fact (unlike the fact that the ball is red and God is good). I didn't define atomic facts; the most straightforward way to do that is by linguistic means: atomic facts are those that make true atomic sentences or proposition. The reader at this point can probably guess what I, as a metaphysical realist, find wrong in this idea; viz., there is no reason to assume that atomic sentences and proposition are made true by atomic (viz., supposedly simpler) facts. Simplicity in language and simplicity in reality do not need to go hand in hand. I would rather define atomicity for facts directly; this cannot but be a sketch, since I did not explore the composition and structure of facts, but an idea could be that an atomic fact is a fact not composed by further facts; or, following the tradition of logical atomism, atomic facts could be those in which an n-tuple of object enters a single property or relation of arity n.[38] I leave these options on the table, and move on. Thus we have

[38] I cannot mention relations if I want atomic facts to be presupposed in my account of relatedness; I must simply say "a property of arity n", which would wield the consequence that relations are a subset of properties. However, normally the word "property" is reserved for monadic properties (viz., of arity 1). I take this to be a matter of book-keeping, and not a real issue.

C&H$_2$) F is a relation if and only if it is not possible that both (i) there exists some entity x that is F and (ii) there exists no y distinct from x that, together with x and F, composes an atomic fact

Is this C&H$_2$ acceptable? No. As Cover and Hawthorne (1999: 68) note, some relations pose counterexamples to it, and to every previous version of it. In fact, these criteria exclude the possibility that a relation F might hold only between something and itself. But this is clearly a possibility: some of such relations are reflexive, but not all of them are. Consider *love*. *Love* is neither reflexive nor irreflexive; and it seems a genuine possibility that of a "narcissistic world" in which all people love themselves, and nobody else. Therefore, it is possible that x loves (or is loved), but there is no distinct y for x to entertain this relation with in an atomic fact; and thus, according to C&H$_2$ *love* is not a relation. There is, fortunately, an easy fix for this problem, which works by reversing C&H$_2$ in the following way:

C&H$_3$) F is a relation if and only if (i) it is possible that there exists some entity x that is F, and (ii) at all worlds in which (i) obtains, there exists an y distinct from x that, together with x and F, composes an atomic fact

In short, relations are those that, at least possibly, compose an atomic fact with the help of more than one thing; C&H$_3$ and W$_G$, as criteria for relatedness and arity, still work together very well. However, as definitions, they presuppose a number of metaphysical phenomena such as (atomic) facts and their composition, instantiation, property, and so forth… This is only part of the story about the phenomenon of relatedness. Furthermore, the W$_G$ criterion for arity is modal in character, as it deals in possibilities; this, as I suggested earlier on in this Chapter, suggests that it can hardly function as a definition –or as a metaphysically basic characterization– of arity. However I will tentatively employ C&H$_3$ and W$_G$, as criteria for relatedness and arity; for they appear to be at least extensionally adequate.

The second problem of this family of criteria (C&H$_3$ and W$_G$ included) is that they deliver the wrong result in at least one case: that of *identity*, in the sense of what is usually formalized through the equality sign "=". According to these criteria, identity is not relation, and its arity is 1; this was the intended result for Wehmeier, since he was following the Wittgensteinian tradition according to which there is *no relation of* identity. I am not going to pursue this troublesome debate, and I would rather prefer to use a criterion for relatedness that does not exclude since the beginning that identity is a relation. Unfortunately, this is no easy job.
I will employ C&H$_3$ and W$_G$, and I will continue to talk about identity as a relation, even if, strictly speaking, C&H$_3$ and W$_G$, dictate that identity is not a relation. There are reasons to think that identity constitutes the limiting case of a relation (e.g., the limiting case of an equivalence relation –the smallest one, in which the equivalence classes in the extensions are just singletons); as limiting case it might be excluded by the scope C&H$_3$ and W$_G$. The reader might think this conclusion to be unsatisfying and *ad hoc*. She would not be wrong. To be honest, I am sympathetic with many of the arguments according to which there is no genuine relation of identity; but the notion is metaphysically too useful to be discarded.

I claimed that one of the goals of this thesis is to evaluate realism about powers, in the light of the claim that the world consists in objects having monadic and intrinsic properties. What do I mean by

that, and more specifically, what do I mean by "monadic" and "intrinsic"? With "monadic", I mean of arity 1, as characterized above. *Intrinsicness*, and its contrary, *extrinsicness*, is a whole other matter.

Roughly put, a property is intrinsic if and only if having it merely depends on how the object is, rather than its environment and the objects it involves. An intrinsic property is merely about its bearer, and nothing else; this means that its bearer never acquires or loses it as a result of a change in environment, and every other entity that is qualitatively exactly alike it, independently from its environment, has it as well; in Lewis (1983) words, intrinsic properties are shared by perfect physical duplicates. But how to make these definitions more precise?

To make things worse, there famously is an air of circularity to the previous definitions; for it simply won't do to qualify intrinsic properties as those that merely depend "on how the object is" –one needs the qualification: "on how the object *intrinsically* is". Similarly, the notion of a perfect physical duplicate may seem to be intuitive enough; a perfect physical duplicate is something like a perfect clone, a xerox, a photocopy. Yet philosophical details make it difficult to use the notion for the definition of intrinsicness; two things may be defined as perfect physical duplicates if, say, they share all intrinsic, or natural properties. But both proposal, either explicitly or implicitly, threaten to make any definition of intrinsicness through duplicates circular. And finally, one may want to define an extrinsic property as one that can be acquired or lost without undergoing any change –but of course what one really means in proposing this definition is "*intrinsic* change". So that doesn't really help either.

Here is how I would tackle this problem. First of all, *extrinsicness* is clearly linked to the phenomenon of *relatedness*. For it would appear that the simplest way to obtain an extrinsic property is to "close a place" of a relation. For example, assuming that Paris loves Helen, it would seem that the ordered pair <Paris, Helen> instantiates love; but it is also the case that Paris instantiates the property *loving Helen*. This is what is sometimes called a relational property or a relational accident, which also *prima facie* appears to be an extrinsic property. This suggests that extrinsic properties are defined as those that depend on, and are grounded upon, relations (an option explored in Francescotti 1999); after all, even if it is not literally the case that such relational properties are (to use Russell's words again) merely a cumbrous way of describing relations, it seems that they depend on relations: that Paris instantiates *loving Helen* appears to depend on the relational fact that Paris loves Helen.

We have already seen, in the previous section, Lewis and Langton (1998) definition of intrinsicness –and explored the reasons why, as a merely modal definition, it is bound to fail. An option explicitly developed to surpass such problems is Rosen (2010: 112) grounding-based definition of intrinsicness, according to which:

> "F is an intrinsic property iff, as a matter of necessity, for all x: If x is F in virtue of ϕ(y)—where ϕ(y) is a fact containing y as a constituent—then y is part of x; and If x is not-F in virtue of ϕ(y), then y is part of x."

I introduced the notion of intrinsicness by claiming that a property is intrinsic if and only if having it only *depends* on how the object (intrinsically) is. Rosen takes talk of dependence very seriously, by deploying an hyperintensional relation of grounding to do the job. Now the fact that, say, the number 2 necessarily covaries with some x being red it is not sufficient to make *being red* extrinsic: for x is not red in virtue of any fact involving the number 2. Rosen's account, as far as I can tell, is not plagued by circularity of any sort.

Although I have defined intrinsicness as a feature of properties, sometimes it is considered and evaluated as a feature of property instances, or as a "way for a property to be instantiated"; so that an

intrinsic property is a property that can only be had intrinsically, whereas an extrinsic property is one that can also be had extrinsically. This is implicit in Rosen's definition, as intrinsicness is defined through a condition imposed on an arbitrary x having the property. More generally, intrinsic properties can be defined as those that can only be had intrinsically; the others are extrinsic. Therefore it may be possible to have an extrinsic properties in an intrinsic fashion.[39]

I think that there is an interesting story to be told about the correlation between Francescotti's and Rosen's accounts of, respectively, extrinsicness and intrinsicness. *Prima facie*, they do not appear to be incompatible. But there is more than that. They are both grounding-based, and I suspect that they fit together in a bigger picture; for example, consider that, assuming the y in Rosen's definition to be a numerically distinct object from x, many facts ϕ(y) grounding non-intrinsic properties would indeed appear to be relational facts which involve both x and y.

Even if, as I claimed, modal notions are not up to the task of defining intrinsicnes, or extrinsicness, we can occasionally use modal tests of dependence as a rule of thumb for extrinsicness. For example, we could use a biconditional such as the one presented in Molnar (2003: 102):

> "x has P intrinsically iff x's having P, and x's lacking P, are independent of the existence of any contingent object wholly distinct from x, or any going-on (events, processes) that do not involve x."

Here, the "independent of the existence of any concrete object…" may be understood modally, similarly to Lewis and Langton's previous notion of "loneliness", and contrariwise, "accompaniment". According to this characterization, an an intrinsic property would be one that can only be had intrinsically. Other properties are extrinsic. This isn't, mind you, a definition, nor a metaphysically deep characterization of intrinsicness, nor even a claim that I hold to be literally true. It is however quite useful; excluding limiting cases involving God, Platonic numbers, or others necessary beings, it has some degree of extensional adequacy, at least in the most paradigmatic cases.

As it is usual in this thesis, I employ one account (viz., Rosen's grounding-based account of intrinsicness, paired with Francescotti's account of extrinsicness), but with an open eye for the other accounts (viz., modal ones, the duplication one, and the change-based one) whenever their strengths will be needed –as it is not my goal to unequivocally choose between them.

6. Some choices about dispositional language

Finally, I would like to offer some qualifications on the dispositional lexicon employed in the rest of the thesis. As I already claimed, I will use terms such as "power", "disposition" and "dispositional property" synonymously. In natural languages such as English, "disposition" appears to express features that account for changes suffered by their bearers –whereas "power" has a more active connotation; e.g., we wouldn't refer to malleability, the property that allows gold to deform under tensile stress, as a "power", but rather as a "disposition". In what follows, I give no weight to such

[39] For more, on these matters, see Marshall and Weatherson (2018). Furthermore, here is a potential trouble for Rosen's account: what of properties that are not instantiated in virtue of anything else? Because of the *ex falso quodlibet*, the *definiens* trivially qualifies all properties that are only instantiated in fundamental facts (viz., facts that do not obtain in virtue of any other fact) as intrinsic. Assuming those properties to be the fundamental properties, this means that fundamental properties are never extrinsic –which seems an needlessly strong conclusion to come out from a mere definition. I will not discuss these issues further.

distinctions of natural language (and anyhow, the difference between active and passive powers is not of crucial importance in this thesis). A commonly associated expressions is "causal power". There surely is a deep correlation between causal and dispositional concepts; although it is often unclear which, if any, the direction of explanation should be; it may be, as in Mumford and Anjum (2011: 7ff) that *causation* and *dispositionality* are so intricately interrelated that it is impossible, as it is, to "start from one to get the other". And surely many versions of power realisms deal in causal terminology; for one, the so-called "dispositional essentialism", according to which properties have essentially the causal powers they have, or are essentially dispositional, is an historically close relative of the so-called "causal view of properties", or "causal structuralism" about properties, according to which properties essentially play the causal and nomic roles they play, or essentially occupy their positions in a causal or nomic structure.

Nevertheless, I will not employ the expression "causal power". As we have seen, many power realists engage in claims of fundamentality; they claim that, *contra* neo-Humean metaphysics, powers are to be found at the bedrock of this world. And yet it is arguable whether causation is fundamental, or it is a more derivative feature –this is a worry that has been expressed even in anti-Humean quarters, and even within the ranks of the power realists (e.g., Bird 2007a: 71 fn. 71, Heil 2012: 130ff). This of course threatens to drive a wedge between causation and dispositionality, in the sense that it makes it possible that, in some contexts powers manifest by generating and governing causal processes, while in others, they manifest in some other way, viz., it is possible that the activity of powers in fundamental contexts is not *causal* activity. As they say, one's *modus ponens* is another's *modus tollens*; thus, the antirealist about powers might conclude that, given that all powers are causal powers, and assuming that there is no causation at the fundamental level, neo-Humean metaphysics is safe from the claim that there are (causal) powers at the fundamental level. None of this is my concern in this thesis: I do not want to argue whether causation and dispositionality are inseparable, and I do not want to argue whether neo-Humean metaphysics is right or wrong. I am to assume, for the thesis' sake, the realist position, but, as we have seen, this is not sufficient to settle whether there fundamentally are powers that are causal. Therefore, I avoid the term "causal power" in its entirety.

What about more specific entries in the dispositional lexicon? It immediately emerges by linguistic observation that we conceptualize and describe powers in terms of their manifestations, what they allow the empowered objects to do in the right circumstances. In these matters I will, for the most part, follow the traditional notation, even if, as we will see in due course, it is by no means metaphysically innocent (it suffices to be aware of it, and adjust it if necessary). What is this "traditional notation"? E.g., we may characterize some of the powers of gold by saying that it has a poor disposition to withstand compressive stress, viz., that is more apt to "deform when compressed". This might be sometimes hidden under what (Bird 2007a: 18-19) calls *covert,* instead of *overt,* lexicon, which does not explicitly mention such a manifestation. It is the case of most English adjectives ending in "-ile", "-ible", and "-able" and the corresponding nouns "-ility", "-ibility", and "-ability" (but other covert terms for powes are not of that form, e.g., "elastic"). Although the transition between the two kinds of expressions might not always be straightforward, it is most of the times clear (e.g., "malleability" is the covert term for the disposition of gold to deform when compressed). This does not only happen in scientific terminology, but also in our everyday talk; we might have an irascible co-worker, in the sense that she has a disposition to get angry. The English language affords several ways to express the correlation between a power and its manifestation, with the help of at least three prepositions: "to", "for" and "of'. The most common expression, inside and outside the philosophical panorama, is "to" (as in "the disposition to deform", or "the power to fly"); however someone has of late adopted a more

philosophical jargon according to which "powers, or dispositions, are [...] *for* some behavior" (Molnar 2003: 60, emphasis mine). The expression "power of..." is deceptive because what comes after is often not a description of the manifestation, but rather another name for the same power recasted in covert lexicon, as in "the power of stability".

For the most part, I will employ *overt locutions*, as in adjectives like "disposed to…", or nouns like "disposition to…", "power to…", or "power for…". I will omit stimulus specification, but that is, more often than not, a question of simplicity: most of what can be said about the correlation between a power and the manifestation can be rephrased as about power and stimulus. Once again, in following this notation, I am employing a somewhat deviant form of English that is only proper in the philosophy room; for example, an expression such as "disposed to…" is ordinarily associated to "willing to…", which introduces a connotation of volition and intentionality that I have no interest in discussing (but see Chapter 1 for the widespread mistake of conflating all powers unto rational powers).

As discussed in Vetter (2015), the layman's English more naturally expresses powers and dispositions through modal verbs, as in "Superman can fly". It is perhaps worth noticing that "can" sentences, unlike "disposed to…" sentences were traditionally exempted from semantic analysis of dispositions, and usually not even considered to be pieces of dispositional language at all. Traditionally, "can" sentences are considered cases of *de re* possibility –in the sense that a natural language translation of their presumed logical form will most likely display a "possibly" adjective; for instance "Superman can fly" is awkwardly rephrased as "Superman is such that he possibly flies". However, "can" sentences in natural language are clearly dispositional sentences (after all, the sentences "Superman can fly" and "Superman has the power to fly / the power of flight" appear to be almost indistinguishable to the layman). However, I will not employ "can" modal verb to express dispositions.

7. The world we live in

It is time to summarize the considerations brought forward in this chapter. The world we live in consists in an objective reality; in this objective reality there are possibilities and necessities, although they usually call out for an explanation. Whether or not modality is fundamental, I do not know.

I admit that these claims are, to some extent, open to debate; there is some resilience of language and, more generally, linguistic and epistemic activities, when it comes to the discipline of metaphysics. First of all, one must consider the relevance of why-questions and because-answers in matters of metaphysical explanation. Secondly, there is some ineliminable residual importance of language when extracting ontological commitment from sentences. Relatedly, I have introduced Quinean metaontology, according to which the job of metaphysics is to extract ontological commitments by observing quantification in a privileged set of sentences, and contrast it with two alternatives, motivated by similar concerns of "objectivity" about metaphysics. These two alternatives involve *truthmaking* and *grounding*. Although both those notions can be of great use to the metaphysician, the correspondent metaontologies (especially in the case of truthmaking) threaten to generate too massive a gap between language and reality; for a number of reasons, I prefer to stick to an extension of Quinean metaontology that allows for second-order quantification as well –although I make extensive use of metaphysical grounding in the course of the thesis.

I consider myself a friend of hyperintensional distinctions, although whether or not such distinctions carve objective joints of reality, I cannot tell. The world I am investigating is furthermore constituted by (material) objects, properties, and relations, arranged in facts. I help myself with a number of notions,

including metaphysical grounding, to define important concepts such as *arity*, *relatedness*, *extrinsicness* (and its contrary, *intrinsicness*).

It is over this metaphysical background that I discuss power realism, viz., the claim that there are powers to be added in this objective reality. But what does it mean to "add" powers to reality, especially if one considers the metaontological issues discussed above? How has power realism been framed in the literature so far –and, more importantly, which is the best way to do it? This is what I now pass to discuss.

CHAPTER THREE
THE QUESTION OF REALISM FOR POWERS

1. Introduction

Albeit sometimes overlooked, the metaontological features of the debate between realists and antirealists about powers are quite peculiar. In the first Chapter I introduced the debate between friends and foes of powers throughout the history of philosophy, up to contemporary metaphysics and philosophy of science: the debate, as we have seen, can be understood as a debate over the existence of powers, or over their fundamentality, or over the nature of properties. Finally, it can be taken to be a semantic dispute over the semantics of dispositional ascription, or over the viability of (some version of) the conditional analysis. All of these characterizations have been used in recent literature. Unfortunately, not only does this multiplicity of interpretations make it unclear what the genuine bone of contention is, if there is one; some of them appear to be mutually exclusive. This suggests a general concern about the question of realism for powers (for brevity, QRP), and consequently, about the positions endorsed by realists or antirealists.

This Chapter purports to answer the following question: what does QRP really amount to? What is it that friends and foes of powers are disagreeing over? I will present and discuss all of the previous characterizations of QRP. To help myself, I will introduce three degrees of ontological involvement in dispositional truths; viz., three ways, of increasing ontological robustness, to read ontological commitments from dispositional truths. Only the third, and strongest degree, will be identified with realism proper about powers, intended as an ontological agreement (viz. over the existence of something). I will resolve an apparent incompatibility between two formulations of QRP, based on a related ambiguity in the use of expressions such as "powers" and "dispositions".

A preliminary note. The uninformed reader might wonder who these "realists" and "antirealists" about powers are supposed to be, and what their position is. Unfortunately, this question generates a problem of method: since my goal is to clarify what the disagreement between realists and antirealists consists in, I cannot start by giving a definition of their contrasting views. I can however, in a extensional rather than intensional fashion, list who these people are, at least the most prominent ones; some of them have already been introduced in the first Chapter, and more will be provided in the course of this one. Realists are, e.g., Harré and Madden (1975), Cartwright (1983, 1989), Ellis and Lierse (1994), Martin (1997, 2008), Ellis (2001), Heil (2003, 2012), Molnar (2003), Mumford (1998, 2004), Bird (2007a), and Mumford and Anjum (2011). Antirealists are, e.g., Carnap (1936), Ryle (1949), Goodman (1954), Armstrong (1997), Lewis (1997), and Fara (2005). A general rule of thumb is the following: philosophers of neo-Humean sympathies, deniers of necessary connections or supporters of any form of Humean Supervenience are more likely than not antirealists, since a world with genuine powers would be an inherently modalized world with non-contingent relations between properties, objects, states or events. Let us begin.

2. A question of existence

As Quinean metaontology would dictate, the easiest (albeit not uncontroversial) way to understand a debate about the reality of the Xs is as a debate about whether there are Xs, or whether Xs exist –for simplicity, I take these expressions as synonyms. This case is no exception: one may think that realists and antirealists about powers disagree over the existence of a specific kind of entities: powers. Thus the

disagreement between realists and antirealists should be seen as an ontological disagreement over what exists.

This is seldom explicitly stated in the literature, although it looks like a background assumption. For instance Molnar (2003: 159) briefly summarizes antagonists of powers as "theories that […] deny the existence of real powers"; and similarly Bird (2007a: 45) partially qualifies his preferred position as "the claim that potencies exist", while "some philosophers, such as David Armstrong, deny that potencies exist". Furthermore, even if there are different types of realism, they all "share a commitment to the existence of some potencies". One easily gets the idea that QRP has always been framed as an existential debate; the neo-Humean diktat preventing its supporters from accepting powers is, after all, that "there are no necessary connections between distinct existences"; and the consequent ban on powers, forces and necessities can easily be read as an existential ban. Thus in their seminal Ellis and Lierse (1994: 28) the authors claim that "in Hume's theory, there are no causal powers, capacities or propensities".[40] Conversely, its adversaries are supposedly those who accept inherently modalized entities like powers. Somehow, powers have built-in everything that is required to provide the world of a natural order, and enrich it with possibilities, necessities and conditionals of various sorts. Powers are thus supposed to do some metaphysical heavy lifting that was previously done by other items, like strong, genuine laws of nature and/or a plurality of possible worlds –that for various reasons friends of powers think to be ontologically more problematic. Thus there seems to be a trade-off between distinct ontological commitments; e.g., an inherently modalized world of powers, versus a plurality of de-modalized worlds. Michael Esfeld goes on to write about what he calls "Humean metaphysics":

> "There are no *powers* or *dispositions* at space-time points over and above the intrinsic and categorical properties that occur at these points. Indeed, Humean metaphysics has no reason to admit dispositions at all."[41]

As introduced in Chapter 1, it is occasionally argued that we need powers for a scientifically accurate vision of the world, distinct from the inert and passive universe that neo-Humeans inherited from Newtonian mechanics (Ellis 2001); and similarly Cartwright (1989, i):

> "capacities are real. […] I want to focus on the special case of causes and capacities, and why we need them. They are a part of our scientific image of the world, I maintain, and cannot be eliminated from it."

Thus we get a very simple (perhaps simplistic) view of QRP; there are two opposing sides arguing about the existence of entities of a specific kinds (viz. powers), which presumably share at least a partial and initial grasp of what powers are supposed to be –of their intrinsic character and nature.

3. Beyond existence

[40] Whether or not this is what Hume thought, or whether Hume specifically intended it as an existence statement, is a different issue. The neo-Humean orthodoxy, more than David Hume, owes to the work of David Lewis, who was perhaps the first to positively enforce the 'no necessary connection' diktat in a systematic metaphysical picture.

[41] Esfeld (2010: 121-122). The reader will note that Esfeld does not merely say that there are no powers, but that there are no powers *over and above categorical properties*. I will soon come back to this.

However, to merely describe QRP as an existence question is partial and insufficient. In what follows, I will explore three different (yet interconnected) ways to understand QRP.

3.1 A semantic –or truthmaking– question

Dispositional locutions are ubiquitous, both in everyday life and scientific lexicon, and only an insignificant minority believes that they should be abolished rather than established as part of the language of science. Quine (1973: 8ff), and possibly earlier on in Quine (1960: 203-207), was one of the few to ever hold this opinion. As we have seen, dispositional terms belong to a variety of grammatical categories; some of them are nouns, thus appear in substantive positions, such as in "ductility is measured by grain size"; but more likely than not, dispositions are *said of* objects; a great deal of entries in dispositional lexicon are thus adjectives appearing as a predicative adjective ("Socrates is disposed to dance"); others are nouns, appearing as a further argument of the predicate ("Icarus has the power of flight"). Whatever sentence includes such dispositional terms, I call *dispositional sentence*; true dispositional sentences I call *dispositional truths*.

As it is, it is not a straightforward task to extract ontological commitment to powers from dispositional truths. Some cases are easier than others (e.g., "ductility is measured by grain size"). Other cases are more complicated, as in the commonplace examples of dispositional terms appearing in predicative positions (e.g., "Socrates is disposed to dance"). In the standard formalization of subject-predicate sentences no commitment to anything corresponding to the predicate is expressible in first-order logic. A proper Quinean would thus say that dispositions belong to the *ideology*, rather than the *ontology* of a theory; this is why I suggested, in Chapter 2, to extend Quinean standards of ontological commitment to second-order quantification. Aside from that, commitment to powers is more easily perceived by those who take predicative expressions to be referring, or who accept ontological commitment to properties in subject-predicate sentences of the natural language: e.g., those who would license the transition from "Socrates is white" to "there is something Socrates is".

In general, however, commitment to powers is more pervasive than commitment to properties: die-hard nominalists such as Quine or Goodman feared commitment to powers in sentences such as "this match is flammable" (and explicitly for this issue, Goodman 1954: 42). A divisive issue then becomes whether one should take those truths at face value or try to analyze away the controversial commitment. A number of different reductive analyses of dispositions and their ascriptions, mostly building on the *prima facie* correlation between dispositions and various kinds of conditionals, were developed to provide necessary and sufficient conditions for objects being ascribed dispositions. There are several conditional (or inferential) analyses, as in Carnap (1936), Ryle (1949), Goodman (1954) and Quine (1960). Roughly speaking, it is a way to neutralize talk of powers. As we will see, the idea of a conditional "analysis" hides a variety of different, yet often conflated, enterprises: from semantics to conceptual, and finally metaphysical analysis. But in general, they are motivated by the hope of having dispositional truths without being committed to the existence of powers: thus QRP appears to be strictly correlated to the success or failure of the conditional analysis.

However, this is not exactly right. Surely proponents of similar analyses such as Ryle (1949) and Goodman (1954) were guided by the prospect of having dispositional truths without any commitment to occult powers those truths appeared to be about. And their adversaries seemed to fight them over this issue; in their seminal defense of powers, Harré and Madden (1975: 85) write about their opponents:

> "We are recommended to treat [dispositional ascriptions] not as categorical assertions of the presence of a mysterious or non-mysterious quality, but to analyse them all as hypothetical or conditional statements, or conjunctions of such statements."

Additionally, it is an historical fact that many realists read the difficulties encountered by conditional analyses as an invitation to develop ontologies with a strong insistence on powers. For one, Martin (1994, 2008) seemed to be deeply moved by the idea that the presence of finking interferences, which work by removing a stimulated disposition before it could manifest, showed that dispositions can be acquired and lost like any other genuine property, something that the (simple) conditional analysis was not able to detect.

In reality, the relation between the conditional analysis and QRP is very flimsy –and not only because, as rightly noticed by Bird (2016: 350) "the initial impetus [of the conditional analysis] came from verificationism", rather than a project of ontological elimination. To my eyes, the problem is rather that even if a conditional analysis is successful against all counterexamples (something similar holds, I would say, for other similar analyses), all that it would establish is that dispositional sentences and some kind of conditionals are materially equivalent. This, *per se*, does not eliminate the commitment to powers in one side of the biconditional. If anything stronger is claimed by the conditional "analysis", for instance that it provides meaning-preserving translations, how could the commitment to powers vanish from one side to the other –given that they have at least the same truth-conditions? Either both sentences commit to powers, or neither of them does –which seems to be a matter of choice (this is of course an instance of Alston's (1958) "symmetry objection" against paraphrases). In short, the success of conditional "analyses", as mere biconditionals, is not a *sufficient* condition for the elimination of powers from the ontology. And any interpretation of the analysis that is as strong as the identity of truth-conditions will short-circuit the strategy of linking dispositions with conditionals for this specific purpose. Similarly, the conditional analysis does not decide which side is metaphysically prior or apt to reduce the other. One could read it either way –depending on their philosophical sensibilities. Manley and Wasserman (2011: 1193-1194), in proposing their version of the analysis, immediately clarify this point.

There remains the idea that the conditional analysis could be a divisive issue insofar as it is considered as a provider of truth-conditions for dispositional truths without the help of genuine dispositions. According to this reading, the "iff" in the analysis covertly separates a dispositional sentence in the object language, which is not used, but said to be true, from a semantic metalanguage sentence giving necessary and sufficient conditions for said truth. That would make the conditional analysis unlike any standard antirealist's paraphrase; dispositional truths do not have to be substituted and are accepted as literally true. The idea rather is to provide an ontologically innocent semantics for dispositional talk.

The idea that realists and antirealists are separated by the semantics they give to dispositional truths is a recurring thought in the literature.[42] But keep in mind: the material adequacy of the biconditional would still be insufficient to support the claim that the conditional side gives truth-conditions to the dispositional side. For sure, some would read the conditional as giving truth-conditions to the dispositional sentence, thus avoiding the apparent commitment to dispositions in dispositional truths. But there is no compulsion to do that; in fact, why not do the contrary and provide a power-based semantics for counterfactual conditionals, as in Jacobs (2010)? In short, which side of the "iff" in the conditional analysis is object language, and which is semantic metalanguage appears to be, once again, a

[42] Since, at least, Harré and Madden (1975) and Ellis and Lierse (1994). For the conditional analysis as providing truth-conditions to dispositional truths, Fara (2005).

matter of choice. Ironically, realists attempting to give power-based accounts of conditionals are now plagued by the same problems that troubled their antirealists adversaries –viz., counterexamples to the material equivalence between dispositions and conditionals. To be sure, whether the right semantics for dispositional truths involve dispositions, rather than conditionals, *is* a deal-breaker between realists and antirealists. Yet mere material equivalence between dispositional sentences and conditionals undermines the choice between the two directions; a prior, deeper philosophical choice (and thus, a deeper disagreement between the two camps) is needed to motivate the choice between the two reading of the biconditional. What is more, not everyone, in either camp, is ready to accept the material equivalence itself. In conclusion, the success or failure of the conditional analysis is not a decisive factor in QRP.

The success of the conditional analysis as a semantic enterprise is not the only way for realists and antirealists to approach dispositional truths and their commitments. Even assuming one has an adequate biconditional linking a dispositional sentence to a conditional, a different attitude could be the following: what is it for those (equivalent) sentences to be true? What is needed in the world for them to be true? In this new perspective, side-stepping from dispositional talk to conditional talk (even if the latter is formulated in a semantic metalanguage) does not accomplish much.
The idea of taking a full-bloodedly metaphysical relation of *truthmaking* as a detector for ontological commitments has risen to prominence in recent years, but this approach to dispositions and conditionals has been championed by David Armstrong since the late '60s (relatedly, see Martin 1997, 2008: 18-19). We have already introduced this metaontology in Chapter 2; the alleged advantages of this approach have therefore already been discussed. First of all, it allows one to be committed to items corresponding to expressions in predicative position (Armstrong 2004: 23). Secondly, and perhaps more importantly, truthmaking might be an important tool for those who want to escape the trappings of "linguisticized metaphysics" (Heil 2012). In this specific instance, both realists and antirealists may decide that their disagreement cannot and should not be settled by whether, in and in terms of what, dispositional discourse can be analyzed away, but rather by considering what, ultimately, there is in the world to make such discourse true. In the light of the previous problems surrounding it, the antirealist may want to claim that a conditional analysis of dispositions is too tall an order to deliver, and perhaps a misguided one as well. Thus, realists and antirealists agree (or should agree) that there are dispositional truths, and do not bicker (or should not bicker) about analyzing them. Their disagreement is rather detected by checking what is needed in the world for dispositional truths to be true –and perhaps the corresponding conditionals as well (many realists claim that dispositions make true the kind of conditionals traditionally employed in the analysis –paradigmatically, Jacobs (2011)). For example, David Armstrong, truthmaker theorist and somewhat uncontroversially a foe of powers, never bothered with the conditional analysis of dispositions (and to some extent, neither did he seem to be bothered to provide a truth-conditional semantics for dispositional discourse). On the contrary, he describes one of the main difficulties of his ontology without powers as the difficulty of finding the right truthmakers, as in Armstrong (1997: 81):

> "If a thing has a certain mass, it is certainly true that it is disposed to act in certain ways. The problem is to find *truthmakers*, entities in the world that correspond to these truths."

We have seen the merits and limits of this proposal, mostly motivated by a radical version of metaphysical realism, throughout Chapter 2.

2.2 A grounding question

I presented some difficulties in extracting commitment to dispositions from dispositional truths. However, in a way, if one accepts the truth of "Icarus has the power of flight", one should also agree that Icarus has the power of flight, so that Icarus is so-and-so empowered. David Lewis is surely no power realist, but in Lewis (1997) he not only accepts dispositional truths, but actively uses them in the formulation of his conditional analysis. Similarly, Fara's (2005) habituals analysis start with the sentence "objects have dispositions". However, if it is so unproblematic to assess that things have powers (so indirectly, that powers exist) it might become a significant question to ask: *what is it for something to have a power?* There is of course a connection between this metaphysical question and the quest for truthmakers, or truth-conditions. Thus Fara (2005: 60) writes:

> "I have been interested in the metaphysical question of what it takes for an object to have a disposition, and I have assumed that this question will be answered by giving an account of the truth conditions of disposition ascriptions. "

Something similar goes for truthmaking. The quest for truthmakers for dispositional truths helps in discovering, as it is, the "deep story" about powers.

A well-known tongue-in-cheek passage from Mellor (1974) declares powers to be, in the philosophical orthodoxy, as shameful as single mothers in Victorian England, "ideally to be explained away, or entitled by a shotgun wedding to take the name of some decently real categorical property." For realists it is now time to fight back, because "dispositions, like unmarried mothers, can manage on their own." Antirealists thus think of dispositions as dependent entities in desperate need of some ontological crutches to stand upright. Ellis (2001: 45) defines this thesis as:

> "the thesis that the causal powers, capacities, and propensities of things all depend on what categorical properties they have, and what regularities there are concerning their behavior […] no dispositional or modal properties can exist as properties in their own right. The existence and nature of all such properties must be fully determined, once the categorical properties of things, and the ways in which things having only such properties behave, are fixed."

This dependence thesis usually takes the form of a supervenience claim, or, more commonly of a grounding claim. Another relation that often comes into play is reduction, as many have sought a reduction of powers, either through a conditional (or cognate) analysis, as in Lewis (1997) and Fara (2005), or through a reductive identity with other, more acceptable entities –as in Armstrong (1969). I will not go into the details between these slightly different versions of this account; for the matter at hand all we need is the plausible claim that what supervenes, is reduced or is grounded also exists, thus legitimizing the claim that these debates about powers exclude debates about their existence. I take grounding to be the paradigmatic case. In general, that what is grounded is not eliminated, but rather successfully contained within the ontology, is correlated to a feature of grounding known as factivity. This is more easily expressed by taking grounding (unlike I did) to be a propositional connective, and it amounts to the fact that if "p" grounds "q", then both "p" and "q" are true. Alternatively, if grounding is taken to be a relation between facts (like I did) –according the cookie-cutter theory of facts that I introduced in Chapter 2, where necessarily, if there is a fact that p, it is the case that p (facts are not allowed to "fail to obtain")– the factivity of grounding is not worth stating. Nonetheless: for arbitraries p and q, if the fact that p grounds the fact that q, it is the case that p and it is the case that q.

That being said, the grounding of powers is usually provided in terms of some property, together perhaps with laws of nature to recapture causal and nomic regularities entailed by the object being so-and-so empowered, were the property not sufficient to do it on its own. Antirealists usually take them to be partially grounded in properties that only contingently possess the causal and nomic roles they have, and whose nature is "intrinsically inert and self-contained" categorical properties (Black 2000: 91) –usually called "categorical" or "non-dispositional" properties. Furthermore, given that this grounding or explanation is often of the microstructural kind, for many realists the challenge is to find powers at the smaller interstices of nature, perhaps in those subatomic particles known (so far) to be structureless. A realist, however, is not forced to find a fundamental level of ungrounded powers to score a point (in short, she is not forced to claim that grounding is well-founded); she only needs an argument to the conclusion that powers never disappear from the grounding base; perhaps all powers are grounded, but in further powers: no powers in, no powers out (Ellis and Lierse 1994, Molnar 2003). Either way, that would count as a victory for realists –in the form of a thesis about grounding. A decisive enough argument to the conclusion that powers are so metaphysically persistent, could settle the whole discussion between realists and antirealists, and against a Humean-based metaphysics –see Williams (2011a).

To further reinforce this point, consider that the notion of an intrinsically de-modalized world with no necessary connections, and thus, no powers, is usually[43] put forward with the help of "Humean Supervenience" (Lewis 1986a: ix-x), which can be roughly introduced with his words: "all there is to the world is a vast mosaic of local matters of particular fact […] All else supervenes on that". Albeit it is notoriously difficult to provide a proper definition of Humean Supervenience (as a thesis about modally defined supervenience, this job is complicated by the fact that Lewis takes Humean Supervenience to be contingent) it is not just an existence claim, but one that either involves some notion of dependence, supervenience or grounding. Lewis (1994) introduces Humean Supervenience by claiming that elements of the supervenience base explain why, or in virtue of what, such-and-such differences between distinct worlds obtain. Loewer (1996) describes Humean Supervenience as revolving around an "in virtue of" relation hold between property instantiations, although, as far as I know, this is not the standard formulation.[44]

To conclude, antirealists are not those who argue that there are no such things as powers –in fact, there are; yet they merely are a derivative epiphenomenon, without any serious metaphysical job to do. On the contrary, realists are those who think powers are metaphysical bedrock, to be found at the most fundamental level of reality –if there is such a thing (e.g., Martin 1993: 184, Ellis 2002: 47, and Bird 2007a). Thus, this understanding of QRP as a grounding question appears to be incompatible with the first characterization of QRP as an existence question.

2.3 A nature (or identity) question

Finally, QRP is often formulated as a debate around the *nature of properties*. Realists of all stripes share the position that at least some of the properties to be found in space-time are dispositional in nature.

[43] E.g., Esfeld (2010) and Jacobs (2011).

[44] Quite interestingly, Humean Supervenience can be entirely understood as the existence claim that there are no irreducible external relations, or emergent properties or anything of that sort. Introducing the contingency of the thesis, Lewis (1986a: x) writes that "is not, alas, unintelligible that there might be suchlike rubbish". This suggests the point (that I will discuss later on in this Chapter) that grounding/supervenience questions can be reformulated, without evident loss of content, into existence questions.

The literature may confuse the reader with a sprawling multitude of different formulations of this view; furthermore some of them have an unclear formulation, or are apparently incompatible with the others. For example, Bird (2007a, 2007b) claims that (at least some) properties are essentially dispositional, or that they have a dispositional nature or identity (I will use the two terms interchangeably). Alternatively, some realists claim that (at least some) properties just are powers, or that their reality is exhausted by powers (Mumford 2004). Turning the identity around, powers are properties.

A slightly different formulation is the following. It is claimed by realists that (at least some) properties confer powers or dispositions to objects necessarily or even essentially; it is solely in virtue of those properties that their bearers are so-and-so disposed. A blood relative, and close antecedent of this position is the "causal structuralist" view of properties, according to which every property essentially has the causal and nomic roles it has, and therefore, can be identified and individuated by its position in a suitable second-order structure of properties (with some differences, Shoemaker 1980, Swoyer 1982, and Hawthorne 2001). Antirealists, on the contrary, usually claim that properties confer powers or dispositions to their bearers only contingently. Following Ellis (2001) we may characterize neo-Humean antirealists as those who posit a merely contingent correlation between how things are (their properties), and how they are disposed to behave (their powers).

So we have two major formulations of the realist's position as a thesis about the nature of properties. According to the first, (at least some) properties have a dispositional nature or identity, –what they are, are powers; while according to the second, (at least some) properties essentially confer powers to the objects that instantiate them. Here is an apparent incompatibility between these two formulations: dispositional properties *are* or *confer* powers to objects? The incompatibility lies in the fact that plausible interpretations of those two verbs differ in regard of their symmetry. This is where the lexicon generates an unfortunate merry-go-round. The properties posited by the realist essentially confer powers or dispositions to their bearers; but such properties are themselves also called "dispositional properties", or sometimes just "powers", and taken to be identical or not distinct existences from them. So we get different claims, which are supposed to be equivalent, as:

- powers essentially confer dispositions (as in Contessa 2015)[45]
- dispositional properties essentially confer powers (as in Taylor 2013: 94)

This is curious pair of claims: the problem lies in the fact that if the relation of "conferring" or "being responsible for" is, as it presumably is, asymmetric, there are two cases available. Either "powers", "dispositions" and "dispositional properties" stand for the same items, thus both claims are false; or they do not, and the two claims cannot be equivalent expressions of the realist's thesis.[46] This confusion is, I take, merely verbal, and I will offer a cure for it, later in this Chapter.

For now, never mind that. I will stick to the claim that at least some properties have a dispositional nature. Thus, realists straightforwardly appear to be involved in a thesis about the nature of properties.

3. A complicated debate

I have presented at least four ways in which QRP can be expressed: as an existence question, a question about truthmaking, about grounding, and about the nature of properties. These formulations are not

[45] Contessa (2015) only states that powers confer *necessarily* dispositions to their bearers. In what follows, I ignore the complication generated by the distinction between *necessarily* and *essentially*.

[46] Relatedly, Borghini and Williams (2008) distinguish between "dispositions" and "dispositional properties", and while they stress out that "in actuality what we have is the same thing viewed from two different perspectives" (Borghini and Williams 2008: 27), the distinction between them plays an important role in their account.

usually disentangled, and are used almost interchangeably. For instance Bird's (2007a: 45) favorite position is one according to which "potencies exist and fundamental natural properties are potencies". This is a claim about what exists, about what is fundamental, and about what properties are, all packed in one. Another realist, Ellis (2001: 106ff), who claims his position to be "a species of dispositional realism", characterizes it as including "various causal powers, capacities, and propensities as ontologically basic properties"; then goes to add, introducing the debate with a potential adversary: "but these properties are all dispositional in character, and traditional wisdom has it that dispositional properties cannot be ontologically basic". This is a similarly packed claim. Occasionally, as soon as Mellor (1974), realists might want to qualify their position by claiming that powers are real and self-sufficient properties. This multiplicity of expressions is even more confusing considering that at times it seems that QRP really is an existence question; while other times the issue of existence of powers appears to be a non-starter (Icarus has the power of flight, after all).

Many dispositional truths, appearing in everyday and scientific discourse, enjoy an extremely high degree of credibility, so it may not be a viable solution for the antirealist to give them up, or paraphrase them away. So you may accept, as an antirealist, the truth of "Icarus has the power of flight". Thus, you may accept the existential commitment to powers but deny that QRP is settled by matters of existence.

But this is not the only way out for the antirealist, of course. Many antirealists accept dispositional truths at face value (no paraphrases, no fictionalist treatments and so forth) without feeling committed to the existence of dispositions. For Yablo's (2001) predicament of the antirealist, as introduced in Chapter 2, does not usually bother the antirealist about powers. I have already expressed just how difficult it is be to extract ontological commitments to dispositions from dispositional truths. An ever more problematic issue in reading ontological commitment to powers, is that even if a philosopher of Quinean sympathies admits that dispositional truths are committing to something corresponding to a dispositional term, it is a point of contention what the commitment is about; and even if dispositional terms are referential in nature, it is still a point of contention what they are referring to. This constitutes somewhat of an anomaly –something proper of the debate about dispositions. No one would claim that "the number of planets is 9" is true, and that "the number of planets" is a referring term, but that it does not refer to a number; similarly, no one would claim that "there is a number of planets" is true, but that the domain of quantification needed for its truth does not range over numbers. On the contrary, there is a great deal of discussion as to whether dispositional terms actually stand for dispositions (and something similar goes for quantification). It is an open option for many antirealists to claim that even if dispositional terms and predicates are referential in nature, and stand for something we are committed to in dispositional truths, they do not specify a genuine domain of dispositions. Something similar goes for quantification; the truth of "the ability to dance is unique to humans" commits us to something –the referent of "the ability to dance" –which is unique to humans–, but this peculiar feature has no business being called a disposition. This is, supposedly, a way for the metaphysician of Quinean sympathies to still accept dispositional truths without being committed to the existence of dispositions. Alternatively, an antirealist may think that to argue against the existence of dispositions is an impossible task, and that the antirealist position should be formulated in some other way, either *via* truthmaking or grounding.

This generates a potential oscillation in the antirealist's position. Occasionally she wants to claim that powers do not exist, or that there are no such things as the properties as conceived by the realist; other times the claim is that powers must be grounded, or perhaps reductively identified with something else, and thus successfully contained within the ontology. Mumford (2007: 91) notes a similar oscillation in the work of David Armstrong throughout the years.

4. Three degrees of ontological involvement

I argue that some of this confusion is due to an ambiguity in the use of expressions such as "power" or "disposition". I will argue that there are (at least) three degrees of ontological involvement in dispositional truths, of increasing ontological robustness –three increasing ways to be ontologically serious about dispositional truths. Only the third one can be properly said to be a commitment to powers: unfortunately, expressions as "powers" and "dispositions" are sometimes used to refer to what one is committed to in the weakest degrees as well, thus producing the aforementioned confusion.

The reader should know that with these three degrees of ontological involvement, I am offering a partition of positions involving dispositions *entirely relative to QRP* –as such, it will not discern positions according to other criteria (e.g., monism vs. dualism about dispositional and categorical properties). Thus, it is not meant to be an exhaustive and fully specific taxonomy of all different power ontologies – which is delayed to the next Chapter.

4.1 Weak powers (and realism)

I claimed that, to the limited extent that there are dispositional truths, (almost) everyone agrees that there are powers. Simple disquotation dictates that if it is true that "Icarus has the power of flight", then Icarus has the power of flight. For many, this is sufficient for the conclusion that there is some power Icarus has. This is what I call a *weak power* (for brevity, W-power). Necessary and sufficient conditions for the possession of W-powers are exhausted just by considering the truth of the relevant sentences. E.g.,:

> W_1) Socrates has the W-power to play music iff "Socrates has the power to play music" (or "Socrates is disposed to play music") is true

W_1 can be used as a template for a schema of introductory definitions for W-powers. The ontologically weakest degree of ontological involvement in dispositional truths is that to W-powers. Thus, *weak realism towards powers* (for brevity, W-realism) is simply the claim that there are W-powers, or that some things have W-powers.[47] To be a W-realist is simply to accept that, say, "Icarus has the power of flight" is true, or, similarly, to accept that Icarus has the power of flight. As such, W-realism is widely accepted; proving the existence of W-powers is not a big accomplishment, nor one that settles very much either.

This doesn't mean, mind you, that W-powers are of no use. The notion of W-power is extremely interesting to clarify many points in the discussion about powers, as it corresponds to a "ontologically innocent", or "superficial" sense of powers that many, realists and antirealists alike, have used throughout the years. Whenever someone says that, e.g., "gold has the disposition of malleability", only by saying "gold is malleable", the dispositional property in question is most likely a W-power. W-powers are, again, in simpler words, the dispositions that one can read off from language.

The reader will soon realize just how important the notion of W-power will be in the rest of this thesis. Relatedly, exactly because of their ontological innocence, they are exceptionally suitable to be used in the formulation of power-related principles that an antirealist may want to accept as well. The clearest example here would be the well-known *Alexander's Dictum*; that is to say, necessary and sufficient

[47] A similar version of realism, called "minimal realism" about dispositions is presented in the beginning of Contessa (2015). For this section, I am also drawing overall inspiration from Cameron's (2008: 6-7) stance on existence and disquotation.

conditions for existence in terms of having powers. Consider the following inference; according to an antirealist about powers, there are no powers; so, nothing can have powers; thus, according to Alexander's Dictum, nothing exists. Or the following inference; according to an antirealist about powers, powers are never fundamental; so (on some reasonable assumptions) only non-fundamental things have powers; thus, according to Alexander's Dictum, only non-fundamental things exist. Both conclusions are highly problematic, if not downright unacceptable: nothing exists, or only non-fundamental things exist.[48] Something has very clearly gone wrong, but what? It is not easy to identify a culprit, from the point of view of the antirealist about powers; if anything, principles like Alexander's Dictum would seem to highlight the thought that, in a way –in some sense– everyone agrees that there are powers, or that things have powers. There is an ontologically innocent kind of dispositional talk, which can be easily recaptured with the notion of W-powers; incidentally, I was not the first one to notice this. As I already hinted in previous Chapters, my W-powers largely correspond to Bird's (2016) "predicatory dispositions". I will briefly touch on this topic again, in later sections.

Thus, W-powers are exceptionally suitable for a reformulation of the Dictum that everyone in the debate can accept; reformulated as necessary and sufficient conditions for existence in terms of having W-powers, the Dictum is now acceptable for the realist and the antirealist alike. This is but one of the many cases in which W-powers can make themselves useful: there are many more, considering how many times talk of powers appears in areas of philosophy that are not primarily concerned with QRP in the first place (here is another example: a power-based reformulation of the "ought implies can" principle).

Once these items have been introduced in the ontology, however, the question becomes urgent to account, explain or offer some grounds for their possession. Both realists and their foes offer, through conditionals, habituals, laws of nature and properties of various kinds, a variety of methods to account for things having W-powers (as in the previous sections of this Chapter): when someone asks "in virtue of what is something so-and-so empowered?" she is presumably talking about W-powers.

Thus W-powers are peripheral or subordinate entities. They are conferred to objects in virtue of some other fact about it. Yet if someone is worried that a grounding relation could produce a layered-conception of reality (derivative vs. fundamental, what is there vs. what is really there), consider the following point. The strongest interpretation of biconditionals such as W_1 is that for some x to have a W-power is *just* for some dispositional sentence about x to be true; ultimately there is no commitment to an entity corresponding to W-powers, fundamental or otherwise.

The reason is that W-powers are merely the product of disquotation. At the pain, so to speak, of putting one's linguistic cart before the metaphysical horse, one might be wary of any ontological consequence simply extracted from the existence of dispositional truths. Specifically, ontological commitments that we, in some way or another, are able to extract from disquoted truths should be

[48] Someone may think that "only non-fundamental things exist" is not so bad a conclusion after all; if non-fundamental things are, say, material or ordinary objects such as tables and rocks, and if "fundamental things" are, say, leptons and muons, it is not without precedents to claim that tables and rocks exist, but not leptons and muons. But the danger here is slightly different; the antirealist about powers who defines her antirealism in terms of a fundamentality structure of reality, is already operating with a hierarchy of items, from the (more) fundamental to the non-fundamental (or less fundamental); how is she then claiming that only the non-fundamental exist?

The contrary opinion, that there are fundamental things, but not non-fundamental ones, is espoused in Azzouni (2012), and may have something to do with the arguments, presented in Chapter 2, for preferring truthmaking to grounding: in short, we do not really want a multi-layered conception of reality.

taken with a pinch of salt. Consider the example, borrowed from Armstrong's (1997: 81). It appears to be true that the Sun every day rises in the East, moves in the sky, and sets in the West. Assume that it is true that the Sun moves in the sky. Thus the Sun moves in the sky. One might be tempted to think that, because the sun moves in the sky, then there's the fact that the sun moves in the sky; this is explained by astronomic science, and accounted for as a fact about the Earth rotating instead, around its spin axis (actually, all motion is relative; never mind that). The suggested line of reasoning here is that there is a fact involving the Sun moving, grounded in a fact about the Earth rotating. But this would an extremely perverse way to describe the situation, at least for someone with a penchant to metaphysical realism. Truths of natural language, as clumsily formulated as they are, do not provide immediate access to astronomical facts, of any sort. There's no linguistic high road to ontology. If we reject *error theory* for this specific case (we accept that it is true that the Sun rises to the East, and moves in the sky, and sets in the West), and if we accept the principle of disquotation, it follows that the Sun moves in the sky. But this shouldn't be given too much weight. Something similar goes for W-powers. To claim that there are W-powers and that some objects have W-powers is merely to accept some dispositional truths of our language, which are presumably taken to be ineliminable. If, say, counterfactual conditionals are materially equivalent to dispositional truths, to say that something has a W-power is the same as saying that a counterfactual is true of it.

The widespread acceptance of W-powers is little more (if *anything* in the first place) than an agreement over dispositional truths. Contrariwise, to wonder about the grounds of W-powers is just to wonder about the grounds for dispositional truths.

4.2 Moderate powers (and realism)

W-realism imposes no restriction on the grounds or semantics of dispositional truths. Here is an ontologically more substantial idea: what corresponds to, and is at least partially responsible for, dispositional truths, are very specific properties possessed by objects. To be so-and-so disposed is to be in a specific physical state or another.

Thus I call *moderate power* (for brevity, M-power) whatever property is at least partially responsible, in some way or another, for dispositional truths. Moderate realism about powers (M-realism) is the claim that there are M-powers. Both Armstrong (1968, 1969) and Lewis (1997) are M-realists: they believe that to be so-and-so empowered involves having some property, even if that is not the whole story. Ryle (1949) is an anti-M-realist, albeit he was a W-realist. In fact, one can read Armstrong's (1968) "truthmaker argument" against Ryle's ticket-to-inference view as a tool to climb from W-realism to M-realism.

M-realism implies W-realism but not *vice versa* (hence the names). (Dis)agreement over M-realism is more substantial than (dis)agreement over W-realism; in fact, the two parties are (dis)agreeing over the existence of some properties responsible for dispositional truths –rather than on the existence of dispositional truths themselves. However, nothing is stated about those properties. Thus one can envision a third, more substantial notion of *power,* and, relatedly, *realism*.

4.3 Robust powers (and realism)

Here is a more divisive notion: a *robust power* (for brevity, R-power). An R-power is a genuinely dispositional property, a feature bearing some kind of "mark of dispositionality", a set of necessary and sufficient conditions for being a dispositional property, or a power; more robustly, the mark of the dispositional is what makes a property a power. This is the first time that *dispositionality* itself makes its

entrance in this thesis; as introduced in Chapter 1, the quest for dispositionality will be an important goal to chase in the rest of this thesis.

A natural thought is that an R-power, something bearing the mark of the dispositional, is a property with a dispositional nature or identity, of the kind introduced earlier on. Thus, the thought goes, whenever realists and their foes debate over the nature of M-powers, they are allegedly also debating over whether there are R-powers (a position I call R-realism, which entails, but is not entailed by, either W-realism or M-realism). However, I would like to stress out that the debate over the existence of R-powers and the debate over the nature of M-powers is not one and the same; specifically, it is still unclear whether the mark of the dispositional, which makes a property a power, is given in term of its nature or essence. Dispositionality might not reside in a property's nature.

Furthermore, I claimed before that while, in a sense, the existence of ineliminable dispositional truths forces everyone to accept powers, many of those who accept such truths, and would go as far so as to believe that such truths are ontologically committing to some kind of entity, might still not feel committed to powers. This can now be understood as the distinction between M-powers and R-powers.

Here is a very important point. Now that we have properly distinguished R-powers from W-powers, we are finally in a position to clarify some of the realist's claims. We have seen that realists employ apparently confusing claims such as "powers confer, or bestow, dispositions to their bearers" (or the other way round) –the confusion being that it is not exactly clear what the conferred "dispositions" are supposed to be other than powers themselves. This claim can now be safely reformulated as: "R-powers confer, or bestow, W-powers to their bearers." That is to say, genuine powers or dispositional properties are responsible for things being so-and-so disposed (in the weak sense that dispositional sentences are true of them). Even if it does not equate to a grounding claim, that W-powers and R-powers are paired with metaphysical necessity follows from what I said earlier about truthmaking. If truthmaking is a necessary relation, and if, in accordance of our understanding of W-powers, any object possesses some W-power for every relevant dispositional truth, then, for every R-power an object has, it necessarily generates a dispositional truth, and thus, a W-power. Thus, for every R-power an object has, it necessarily also has some specific W-power, and vice versa.

5. The question of realism for powers

5.1 QRP as R-realism

We now have some tools to decide what QRP is really about. But before starting, I offer the further distinction the between a W-realist and a *mere* W-realist. A mere W-realist, as opposed to a W-realist, is a W-realist who is neither an M- nor a R-realist; a mere W-realist, loosely speaking, is someone who, when it comes to being ontologically serious about dispositional truths, stops at W-realism, and goes no further. Thus, almost everyone is a W-realist, but few are *mere* W-realists, as Ryle, Goodman or Carnap. Something similar goes for M-realism and mere M-realism. A *mere* M-realist is a M-realist who is not a R-realist as well (e.g., Lewis and Armstrong). A mere M-realist is, of course, a W-realist as well, but not a mere W-realist.

Now, let us begin. For starters, we have seen that the relation between QRP and the conditional analysis is somewhat loose, although historically the rise of realism about powers was influenced by the troubles encountered by the conditional analysis. There remains the idea that realists and antirealists are separated by the semantics they assign to dispositional truths, which may or may not include

conditionals. But this cannot be the end of the story about QRP. Secondly, there are good reasons to think that neither W-realism nor M-realism properly deserve to be called realism about powers. For sure, QRP is not the debate between W-realists and their foes. The W-realist camp is filled with what we would call antirealists about powers (Ryle, Goodman, Carnap). In fact *mere* W-realism is the textbook example of antirealism about powers. And W-realism is *per se* neutral with respect to QRP; in fact, the mere acceptance of dispositional truths does not by itself position one in the QRP debate. Similarly, commitment of W-powers is not *per se* any commitment to powers. W-powers are, again, the simple product of disquotation. Something has W-power if and only if a power predicate is true of it – and perhaps there is nothing more to something having a W-power than a true power predication. On some positions, W-powers can only be considered "powers" by courtesy of language: for example, a mere W-realist does not envision any power in her ontology; she does however envision W-powers, just because she accepts truths as "this rubber band is elastic" and so forth. An old school empiricist might agree with a contemporary friend of powers that this rubber band is elastic, but this isn't a genuine agreement over the existence of powers. Thus, W-powers might or might not be powers; on the contrary, the W-powers of a mere W-realist are not powers. This bears interesting consequences in the metaontology of the whole debate. That there is a "loose sense" in which everyone agrees that there are powers, does not really show that QRP is not an existential debate, given that this quasi-universal agreement is over W-powers, and not powers *tout court*.

QRP is not the debate between M-realists and their adversaries, either. A mere M-realist (such as Armstrong) is an antirealist about powers; and M-realism is *per se* neutral with respect to QRP, for to claim that dispositional truths are true in virtue of properties or some physical state of the object doesn't settle whether there are powers in one's ontology. And to accept M-powers is not, *per se,* to accept powers –but merely to accept properties responsible for dispositional truths.

Summarizing, neither W-realism nor M-realism cut at the joints of QRP; even if they might be considered forms of realism, they are not realism about powers, but merely about W-powers and M-powers. Only R-realism, introducing a genuine dispositional character to the properties responsible for dispositional truths, can be conceived to be a form of realism about powers. This might seem to vindicate QRP as an existence debate –about the existence of R-powers, viz., entities bearing the mark of the dispositional. On the contrary, the observation that QRP may not be an existence debate, given a quasi-universal existential agreement, is shown to be inconclusive, as said agreement is merely over the existence of W-powers, and not powers. In conclusion, by properly differentiating W-powers from R-powers, we can observe that the two characterizations of QRP as an existential or fundamentality debate are not necessarily incompatible, although which, if any, is the precise relation between them, remains to be seen. Because of my interest in the notion of dispositionality, I will mostly deal, in what follows, with QRP as an existential debate around R-powers (entities with the mark of the dispositional). The relation between these difference characterizations of QRP will be eventually discussed in Chapter 9, when I will offer my prefer candidate to play the role of dispositionality.

Finally, here is an important reminder. Characterizing realism about powers as R-realism is not the same as claiming that all W-powers have a correspondent R-power. That remains to be seen, and depends on one's philosophical sensibilities. Here is an example to make this clearer. Some friend of power, some R-realist, may accept that the truth "Socrates is irascible", thus accepting the existence of the W-power of Socrate's irascibility; she may also believe that the true sentence "Socrates is irascible" corresponds, and is made true by Socrates having a genuine power of irascibility, an R-power. Some other friend of power (a different kind of R-realist) might disagree, and claim that even though (it is true that) Socrates is irascible, viz., Socrates has a W-power of irascibility, that does not correspond to

any genuine dispositional property of irascibility –viz., no R-power corresponding to Socrates' irascibility. Something else is responsible for that truth, and that W-power –perhaps some other collection of powers, or no power at all. In short: realism about powers *per se* does not impose a bijection between W-powers and R-powers.

On the contrary, such a bijection seems to be too convenient, and highly debatable. Given principles like W_1, the introduction of W-powers in the ontology is merely the result of using dispositional words in the sentences we use to describe reality. But, as we have seen at length in both the previous Chapters, which dispositional words, used in dispositional truths, actually correspond to dispositions proper, is a difficult question to tackle. Thus, without assuming a very convenient bijection between W-powers and R-powers, to say that, say, gold is malleable, is not sufficient to claim that it has a genuine dispositional property –a power of malleability.

This kind of patently false inferences were the ones rightly criticized in Bird (2016). In what I take to be a somewhat arbitrary choice, he reserved the name of "dispositions" for those "predicatory properties" that can be simply detected through language, viz. the disposition that gold has if it is the case that gold is malleable; then he reserved the name "power" for the properties with a genuine dispositional nature; he rightly went on to claim that not all dispositions are powers. There are reasons to believe that Bird's "dispositions" are W-powers, and his "powers" are R-powers; his claim that not all dispositions are powers can now be understood as the claim that not all W-powers correspond to a R-power, viz. there is no bijection between W-powers and R-powers.[49]

There's a crucial consequence, as noted by Bird (2016) himself: the lack of a bijection between W-powers and R-powers entails that many so-called applications of power ontology in other fields of philosophy (viz. the treatment of intentionality, morality, free will) actually fail to hit the mark. If one proposes a dispositional theory of a given phenomenon simply by way of endorsing a number of dispositional truths, this is tantamount to a deployment of W-powers, viz. an ontologically innocent kind of dispositional talk that fails to meaningfully interact with any issue in power ontology and/or metaphysics. W-powers exist in neo-Humean ontologies as well, thus I would assume that such dispositional theories are available to antirealists about powers too. Whether that counts as a success or a failure for such theories, I cannot say.

5.2 Conclusions

With the help of the distinction between W-powers, M-powers, and R-powers, I have framed multiple ways to understand the question of realism for powers (QRP). Commitment to W-powers, as a straightforward result of accepting dispositional truths, carries little metaphysical weight, and is therefore suited to frame that kind of ontologically innocent dispositional talk, that realists and antirealists alike can engage in.

There's only one way to frame QRP as an ontological debate, viz. a debate around the existence of something: R-realism. Generally, the idea that QRP is an existence question concerning R-powers naturally suggests the idea that it should be framed through Quinean metaontology –or a second-order extension thereof. This does not appear to be mandatory, yet is a very inviting idea. For the antirealist,

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[49] That Bird's predicatory dispositions are W-powers can be claimed by observing his claim (Bird 2016: 361) that

> "those who reject the metaphysics of powers do frequently use disposition talk without contradicting themselves. Humeans such as Lewis do not deny that there are dispositions."

This perfectly matches what I have been claiming in previous sections in relation to W-powers.

R-powers are not needed in the quantification domain of dispositional truths (or their second-order existential generalizations); on the contrary, for the realists they are needed.

However, as we have seen, there are other ways to set up QRP, not in terms of the existence of R-powers; but respectively: in terms of the identity of M-powers, in terms of fundamentality of W-powers, or in terms of truthmakers for dispositional truths. None of them are easily reconcilable with Quinean standards of ontological commitments; some of them appear to be closer in spirit to the grounding or truthmaking alternatives proposed in Chapter 2. All of these different characterizations of QRP have been proposed multiple times in the literature, and, for the time being, they all look at least extensionally adequate to carve the realist and the realist camp satisfactorily –although what their relation is with the characterization of QRP as an existential debate over R-powers, is still not clear. My final characterization of dispositionality, the mark of R-powers, offered in Chapter 9, will tie these loose ends; for the time being, I will have to consider all these different characterizations of QRP.

A reason for considering some of these options as somewhat equivalent, is that there is some degree of convertibility between existence questions and "metaphysical" questions, such as questions about the nature or fundamentality of certain properties. This was noted in Schaffer (2009: 365). More specifically, the existence question "are there R-powers?" can be strictly correlated with the metaphysical question "do (at least some) properties bear the mark of the dispositional?" –in much the same way in which the existence question "are there universals?" can be correlated with the metaphysical question "are properties universals (viz., multiply instantiated, repeatable, etc…)?". Similarly, the questions "are there basic or fundamental powers? is there irreducible dispositionality?", albeit strictly existential in character, clearly have more to do with QRP as a fundamentality question, viz., they appear to question the fundamentality of W-powers, rather than the existence of R-powers. Of course this convertibility, even if partial, can have greater consequences in the overall metaontology; if, say, grounding questions can be largely rephrased as existence questions and vice versa, does it mean that Quinean metaontology and grounding-based metaontology are, to the same extent –equivalent? This is a very bold claim. Schaffer was of the contrary advice, claiming that existence questions packed with metaphysical information, as the ones presented above, are not the ones Quinean metaontology is bound to answer; the existence question "are there R-powers?" may belong to this category. In fact, this raises the worry that, even if it is an inviting thought to frame QRP as an existence question about R-powers, in terms of Quinean metaontology, we should refrain from doing it: the notion of R-power simply packs too much metaphysical information (whichever this information is) for R-powers to be simply detected by observing quantification, or reference, in ordinary or scientific dispositional truths.

I will not pursue these matters further. For now, suffices to say that there are a number of ways to set up QRP; e.g., as an existence question about R-powers, as a question about the nature of M-powers, as a question about the fundamentality of W-powers, and finally, as a question about the truthmakers for dispositional truths. These options have all been put forward in the literature, and they must all be taken into consideration –although what the relations between them are, is still unclear.

In what follows I will focus on QRP as an existence question about R-powers –about the existence of entities bearing a genuine mark of the dispositional. This is motivated, as introduced in Chapter 1, by my desire to clarify what this dispositional character ultimately amounts to; and it should at least provide a preliminary clarification of the position of the realist. But what is this "dispositional character" I have been talking about in this Chapter? It is now finally to introduce and discuss the notions of *dispositionality*, and contrariwise, *categoricity*.

CHAPTER FOUR
POWERS AND OTHER CREATURES

1. Introduction

In Chapter 3 I concluded that realism about powers has something to do with the introduction in the ontology of a peculiar kind of entity bearing some "mark of dispositionality" –entities which are dispositional in character. This might sound like old news, but it is worth noticing that no extensive account of dispositionality has ever been given in the literature, and, perhaps even more worryingly, no agreement over the character of dispositionality is explicitly present between realists and antirealists of various stripes.

One way to observe this confusion is, by way of contrast, to consider "categorical" properties; categorical properties are traditionally taken to oppose and contrast dispositional ones; but there is no agreement as to what a categorical property is supposed to be. Allegedly "categorical" properties are non-dispositional ones, for there is purported to be a "dispositional/categorical divide" between properties, in the sense of two mutually exclusive categories for properties; but this doesn't seem to be mandatory, since more recently, a number of power realists have begun to take categorical properties to be dispositional as well. All in all, categoricity appears to be as mysterious as dispositionality. There are, of course, paradigmatic examples for both categories; dispositional properties are *elasticity*, *malleability*, and so forth; whereas categorical properties are properties like *triangularity* and *sphericity* (geometrical or structural features are often said to be categorical). But this hardly counts as an elucidation. Mumford (1998: 75) writes that

> "it is quite difficult to find, anywhere in the literature, a specification of what exactly is intended by 'categorical property' and it is a symptomatic of the vagueness of the distinction accepted thus far that a number of different things are usually put forward as examples of the categorical. […] Most obviously, but least committally, a categorical property is any property which is not a dispositional property –a contrast which cries out for the addition of some positive content."

In this chapter I introduce and discuss the distinction between the dispositional and the non-dispositional, or categorical, or, as it is also sometimes called, qualitative. I will reconstruct past attempt and evaluate them. Setting up the categorical/dispositional divide is no easy task; as it is not clear what one can find at the two sides of the divide: properties? aspects of properties? predicates? Given my remarks on R-powers in Chapter 3 (and my metaphysical realist stance introduced in Chapter 2), I appear to have a bone in this fight; in the sense that I would prefer dispositionality to be a metaphysically substantial characterization of properties, rather than predicates or concepts. Yet more questions about this divide need to be answered: how is it to be framed? Is it really a divide at all? Is dispositionality, or contrariwise categoricity, to be defined by negation from the other?

There are a number of reasons why I embark on such an endeavor. First of all, this is part of my quest for dispositionality, and the role that it plays in the make-up of properties. Which feature of a property, if some feature at all, is what makes it dispositional, or, contrariwise, categorical? Given my previous characterization of the question of realism for powers, as the debate over the existence of R-powers, this is a crucial question to answer, if one wants to know what it is exactly that the power realist is accepting into her ontology. Secondly, this will be the jumping point for the introduction of the latest version of this divide, the opposition between powers and qualities, a distinction regarding the identity of properties. This kick-starts my discussion on two influential alternatives in contemporary power

ontology about the nature of dispositional properties: the Pure Powers view and the Powerful Qualities view. Thirdly, and finally, this will allow me to outline an interesting "roadmap" of power ontologies – which, I believe, has not been done with this level of detail. This is a further attempt to make the realist's camp clearer and easier to access. At the end of the Chapter I propose a useful graph that represents all the prominent versions of realism and antirealism about powers.

2. A divide between predicates

2.1 Conditional entailment

It is commonplace to notice that dispositional ascriptions entail (or license some form of inference to) how the object could or would behave in a set of given certain circumstances. E.g., Carnap (1936/37), Goodman (1954: 34ff), Ryle (1949: 107), Quine (1960: 203-207). Quite simply, a match that is flammable, viz., that is disposed to ignite when struck, is also a match that would ignite if struck. This is purported to provide some characterization of dispositionality, and additionally to divide dispositionality from categoricity. This can be, first of all, read as a distinction amongst predicates (in an intended interpretation); we thus have a way to distinguish pieces of dispositional idiom. I stress out: in an intended interpretation. I would find it disturbing to set up a set of criteria to distinguish dispositional idioms in merely syntactical terms (see Quine (1960: 205)), even if grammar most likely provides a rule of thumb to guide our investigation (hint: terms ending with the suffix "–ible" or "–able" are probably dispositional). Thus,

> D_1) "P" is a dispositional predicate iff: "x is P" entails "x would M if S", (or "it is possible that x Ms")

The D_1 biconditional counts as a "dispositional/categorical divide" (for predicate terms), as it provides necessary and sufficient conditions for dispositionality. One radical way to read D_1 is that dispositional predicates can be isolated from others, in so far as their application conditions are stated through conditionals (or possibilities). The divide is set up by negation; categorical predicates are others, which does not satisfy these conditions.

There are many things about D_1 that need clarification. The first trouble is the relation between the dispositional predicate P and the stimulus and manifestation predicates S and M. How are the latter introduced? In the easiest cases dispositional terms as syntactically compound, as in the case of overt dispositional lexicon like "disposed to… if… ", with both a stimulus and manifestation specification. However, I wouldn't want any part of D_1 to rely on surface syntactical facts (not even shared by all dispositional locutions). Even in the case of covert expressions such as "fragile", I would think that the concept of fragility involves that fragility manifests through breaking after striking; thus input/output specification are conceptually entailed together with the conditional. As I now pass to discuss, the entailment in D_1 is mostly likely not material entailment. In fact, material implication seems too weak for this kind of principle to safely separate dispositional predicates. After all (Mellor 1974) a thing being called "triangular" implies that its corners being correctly counted would produce the answer "three"; and similarly, a "spherical" item is surely one that would roll on an inclined surface. Yet this seems too trivial of a result to make "triangularity" or "sphericity" a piece of dispositional idiom. As in Mumford (1998) I think that the right solution is to claim that "entails" in D_1 should be formalized as a strict conditional, viz. a modal strengthening of the material conditional involving (some kind of) necessity. Perhaps it is conceptual necessity; after all, I stress again the fact that D_1 serves the purpose of selecting

dispositional terms only in an intended interpretation. Another reason to think that dispositional, but not categorical terms, select conditionals out of conceptual necessity comes by considering the transition from covert to overt dispositional terms; for in that transition, the <input, output> pair of stimulus and manifestation is introduced. The covert term "malleability" is conceptually very close to the overt "disposition to deform under tensile stress" –in some way or another–, and this is what presumably makes the transition between the two seamless. But no such easy transition is available for paradigmatic categorical terms; *pace* Mellor's conditional entailment, there is no close conceptual link between "triangularity" and "disposed to be such that if one would count the angles, the correct answer would be three". For example, one may be tempted to define "malleability" as the disposition to deform under tensile stress; but there is no such temptation to define "triangularity" as the disposition to be such that if one would count the angles, the correct answer would be three. Thus, D_1 may help one give explicit definitions of dispositional predicates. Keep in mind, however, that, assuming a stronger divide between dispositional and categorical *properties*, I am not claiming that, necessarily, dispositional predicates refer to genuinely dispositional properties, and similarly for categorical predicates. The make-up of the world might not be as transparent: sometimes we wish to conceptualize the features of the outside world through the potential behavior they elicit –sometimes we don't. The reasons for that might have more of a pragmatic or contextual source, having nothing to do with the underlying metaphysics (e.g., Bird 2007a: 44).

And what about the entailed conditional itself, the one I indicated with the verb "would"? This is usually taken to be a stronger-than-material subjunctive causal conditional, albeit perhaps not necessarily so. For Gilbert Ryle, for instance, dispositional ascriptions are to be paired not to conditionals, but to law-like inferences from certain specific matter of facts to others.

Unfortunately, a problem of extensional adequacy plagues D_1. The main operator in D_1 is the biconditional "iff"; one way to falsify it would be by having the first member true and the second one false; a dispositional term "P" such that it is false that "x is P" entails (in the aforementioned sense) a suitable conditional. The entailment at hand, as said, is a stronger-than-material modalized entailment. According to almost all modal logic, however, $\Box p \rightarrow p$ (T axiom); thus the dispositional term being said of something must also materially imply the subjunctive conditional; if the ascription is true, but the conditional false, the whole second member of D_1 is false.

However, there is (almost) always the possibility of interferences falsifying the consequent in D_1, even in the most paradigmatic cases of predicate terms that we would like the first member of D_1 to classify as dispositional, such as "fragility" or "solubility". The interference problem provides a huge chunk of the literature about dispositions and conditional entailment; I am not going to discuss its details, neither relatively to the dispositional/categorical divide (as in this case), nor relatively to the treatment of dispositional ascriptions (below). As it will become apparent later in this Chapter, I take conditional entailment to be, at best, a symptom of dispositionality rather than its source; it doesn't have to be an infallible, perhaps not even a reliable, way to discern dispositionality in the world (and not even in language –even if there may be problems, I am not troubled by the difficulties in finding and recognizing dispositional locutions).

Keep in mind, however, that for many philosophers of empiricist upbringing, the whole idea of a dispositional/categorical divide to be taken seriously, even at a linguistic level, was moot. Many of them were not worried by the failures of previous attempts to account for the entailed conditional of D_1 in purely extensional terms (an important requirement back then), as in the case of truth-functional conditionals in Carnap's (1936) reduction sentences. Rather, they were of the idea that the job of science was, amongst other things, to eliminate dispositional expressions by depleting their utility in a

theory's explanatory power. In an ideal best philosophical language, there would be no need of dispositional locutions (as in D_1 sense). This is the position of extensionalists like Quine, first introduced in Chapter 1; much of this would now be considered outdated philosophy. First of all, the need to expunge non-extensionality from any philosophical account would now be deemed as unnecessary, while the project of completely eliminating dispositional items from the language of science would probably be considered impossible, and perhaps even unmotivated. However, according to this position, there was really no problem of a dispositional/categorical divide to set up –not even at the level of language.

2.2 Non-Occurrentism

Even without any hope of eliminating dispositional locutions from the language of science and philosophy, many had hoped of using D_1 in order to avoid any commitment to "occult" or "mysterious" powers possessed by objects. Thus we reach $D_{1.1}$, a more specific semantic distinction between ascriptions of dispositional predicates, and ascriptions of categorical ones. $D_{1.1}$, unlike D_1, as a dispositional/categorical divide, is not simply set up by negation, and could be best described as follows.

According to $D_{1.1}$, categorical, or occurrent, ascriptions report properties being assigned to objects; they narrate actual matter of facts or going-ons of the world. On the contrary, dispositional ascriptions involve habits or tendencies of objects to behave in certain ways in certain circumstances (perhaps in the form of a conditional, hence the opposing expression "categorical"). The idea is that, semantically, the existence of dispositional ascriptions shows "that there are […] significant (affirmative and negative) indicative sentences which have functions other than that of reporting facts." Ryle (1949: 104). Details might differ. According to Carnap, dispositional ascriptions are actually complex conditionals in disguise (viz., *reduction sentences*); Ryle espouses the already mentioned "law-like" inference view; Goodman has a more complicated stance according to which, roughly speaking, dispositional predicates constitute semantic expansions (or *projections*) from manifestation predicates. I call this family of positions with the blanket term *Non-Occurrentism* (N-O), as it denies that dispositional predication is occurrent predication –viz., they report no occurrences; no facts, no events, no instantiation of properties by objects. Keep in mind that this position does not require any robust conception of a categorical property; a categorical property is just a property of the object, a *way* it is, or some qualitative state it finds itself in. It is, I take it, a rather "thin" conception of categorical property.

It would take us to far to see exactly what this picture gets wrong; in fact, given that this is considered a standard form of antirealism relatively to powers, it is not really the goal of this thesis to argue for nor against it. However, there are two important points to notice. First of all, as in Mumford (1998: 64), it may be confusing to claim that, in this sense of the word, dispositional ascriptions are "non-categorical" in the sense of conditional to something. The ascription of the manifestation is, but not that of the power. Even if dispositional ascriptions were to be equivalent to ascriptions of conditionals, those ascriptions would not themselves be conditional. It is "categorical", in this sense, that a fragile object would break if struck. This, mind you, is by itself only a terminological point. It does not impact the validity of $D_{1.1}$ or N-O, but only the claim that dispositional ascriptions are non-categorical (in the sense of conditional); however they can still be taken as non-categorical, as they merely ascribe conditionals to objects –even if those conditional ascriptions are, themselves unconditional/categorical (perhaps this point merely highlights some internal complexity in the expression "categorical"). Secondly, some qualifications borrowed from Chapter 3; the family of positions gathered as N-O are all forms of mere W-realists; viz., non-occurrentism is the position according to which there are

dispositional truths, but no property responsible for those truths; in Ryle's words, it is not the job of these truths to report any matter of fact.

2.3 Neutral Monism

In general, the rejection of N-O involves the claim that dispositional predication needs ontological ground in some decently real property. This is what ultimately underlies Armstrong's so-called "Truthmaker Argument" against Ryle's brand of N-O, as it can be found in Armstrong (1968, 1969), and Armstrong, Martin and Place (1996: 15-16). Such "decently real" properties of the object, responsible for the truth of dispositional ascriptions, are what I have baptized M-powers in the course of Chapter 3.[50]

But what kind of properties will M-powers ultimately be? Will we need genuine dispositional properties (R-powers) to make true dispositional ascriptions, in the D_1 sense? We now face a metaphysical divide of some kind, rather than a semantic divide between ascriptions. Thus the question becomes: is there a metaphysically significant distinction between dispositionality and categoricity?

Keep in mind that the question is *not* "how many different types of properties are there?"; rather, the question asks "should we formulate the debate about properties around a metaphysically substantive notion of properties as powers and/or properties as categorical properties?", or perhaps "should we talk about properties as having a categorical or dispositional character?". In other words, the question is not whether there are R-powers in the world, plus "categorical properties" of some kind –or maybe only one of the two categories; the question is rather whether dispositionality (R-powers) and categoricity are genuine metaphysical categories. This point is underlined by a simple distinction: one thing is to argue against the existence of items in one side of the dispositional/categorical divide, another thing entirely is to deny the divide any metaphysical legitimacy. (Some) friends of powers may believe that there are dispositional properties and no categorical ones; contrariwise, foes of powers believe that there are categorical properties and no dispositional ones –yet for both positions, the divide between them is very much real, even if one side of it is not represented in existence.

Thus we go beyond D_1 as a characterization of, and opposition between, predicate and/or ascriptions. However, given the question: "is there a metaphysically significant distinction between dispositionality and categoricity?", the most radical answer would be: no. Although both dispositional and non-dispositional ascriptions are "occurrent", semantically standard predication that involves properties of objects, there is no point in talking about "dispositional properties" or "categorical properties". Again, the point is not simply that there are no two distinct kinds of properties, but that we shouldn't even categorize the properties that exist as dispositional nor categorical. The divide in D_1 cuts no metaphysical ice: it is merely an opposition, generated by conditional entailment, between distinct kinds of predications, ascriptions, or "styles of denoting properties", if one is committed to such things. This position is called *Neutral Monism* (NM).[51] NM is a version of mere M-realism; it accepts that there are

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[50] However, the need for ontological grounds to dispositional predication does not necessarily equate to the claim that dispositional ascriptions ascribe properties to objects: those grounds may be elsewhere. This is the position of Lowe (2006: 8.4, 8.5) who, in the light of his peculiar four-category ontology, describes the dispositional non-occurrent ascriptions as "the attribution of some property […] to the object's substantial kind" –but nothing directly involving the bearer of the disposition.

[51] Mumford (1998), Mellor (2000), and problematically Lowe (2006), and Strawson (2008). It is occasionally difficult to distinguish NM from the Powerful Qualities view (see Chapter 8). The case of Jonathan Lowe is even more complicated, for he claims, in Lowe (2006: 124), that

true dispositional sentences, and that properties of objects are responsible for those truths; however it does not believe in properties with a genuine dispositional character (nor with a genuine categorical character, for that matter).
NM is usually paired with the thesis that each power is identical to its categorical base. Mumford (1998: 190-191) calls is "monism without reductionism"; the identity between what is denoted by different kind of predicates does not have any asymmetry that gives one side the upper hand over the other; thus its neutrality.

3. A first metaphysical divide

If one rejects both N-O and NM, and claims there to be a substantial metaphysical characterization of properties as dispositional and/or categorical, the question immediately arises as to how properly define these metaphysical categories; in other words, we must offer some insight on the mark of dispositionality that makes something an R-power.
Occasionally conditional entailment is introduced not a distinction between predicates, but between properties. The characterization of dispositionality, and thus R-powers, that comes through conditional entailment, as we will shortly see, is what underpins worries of powers as "mysterious" or "occult" properties; but these antirealist worries can in fact be easily dispelled. In the easiest formulation of conditional entailment as a way to carve up dispositionality, we obtain something along the lines of:

$D_{2.1}$) P is a dispositional property iff: if some x has P, then x would… or it is possible that x is…

Similar considerations apply from D_1. The "then" here is presumably not of conceptual entailment, but not even just a material implication; it has the strength of a metaphysical definition; it expresses *what is it* for x to be F. Again, categorical properties, by exclusions, are those not so characterized. $D_{2.1}$ is the first attempt at a D_2 metaphysical divide between the dispositional and the categorical. The idea that dispositionality resides in conditional entailment suggests the following idea: (unmanifested) dispositional properties merely qualify their bearers in a modal or counterfactual way; powers are merely modal properties. On the contrary, categorical properties are taken to be fully actual and non-modal characterizations of objects.
According to a monist position called *Categoricalism* (C), there only are properties that are non-dispositional, or categorical in character. What they often mean, is that there only are properties that are non-dispositional, in the $D_{2.1}$ sense. This is Armstrong's position, first expressed in Armstrong (1969: 24):

"I am opposed to drawing a distinction between dispositional and categorical (or occurrent) *properties*, as though what is at issue here is a distinction between types of property. Rather, I want to distinguish between dispositional and (as I prefer to call it) occurrent *predication*."

This is a very NM-ish sounding claim. However, unlike NM, dispositional and occurrent predication have very different ontological grounds; although there are ontological grounds to dispositional predications, those grounds do not consist in the instantiation of a property (Lowe 2006: 125). Although Lowe's position partially resembles NM (see passage above), and also partially resembles N-O (in denying that dispositional predication corresponds to the instantiation of a property by an object), it is interestingly different from both; in the roadmap offered at the end of the Chapter, the reader will see that Lowe occupies an unique position.

> "If we say that […] the glass has acquired, or lost, some potentiality that is not an actual, categorical, property then we are committed to an ontology of potentialities. In Quine's phrase, we are committed to quantifying over potentialities. Things such as pieces of glass have, or can have, extra properties over and above their categorical properties. But it seems that it is impossible that the world should contain anything over and above what is actual. For there is no mean between existence and non-existence."

If that is the case, then there is a strong resistance to the idea that there could really be properties with a dispositional nature. $D_{2.1}$ is the kind of divide that categoricalists (supporters of C) often hold whenever they want to genuinely talk about properties with a dispositional character.

There is no single clear-cut argument against R-powers according to $D_{2.1}$. It is more of a recurring theme in the literature, expressed in multiple ways from different angles, and not always in the clearest fashion. It closely relates to the reasons that lead supporters of N-O to deny ontological legitimacy to dispositional ascriptions: they retracted from $D_{2.1}$ to the merely linguistic D_1. It also a close relative of the so-called Meinongian Argument that I will discuss in Chapter 6. I will try to give this "recurrent theme" a fair treatment in what follows.

First of all, $D_{2.1}$ claims that dispositional properties are merely modal properties, or counterfactual states of the object. For example, according to $D_{2.1}$ to say that x is fragile is merely to say that x would break if struck (or that it could break –it is possible that it breaks). However, there is an ambiguity in the expression "modal property" –an expression which is used and abused in the literature. What is a modal property, after all? When one thinks of modal properties, in general one thinks of properties that are picked by predicates somehow extracted (e.g., through predicate abstraction) by modalized formulas, open or closed. E.g., if the predicate "P" stands for the property *being polite*, then the predicate $<\lambda x.\Diamond P(x)>$ stands for the modal property *possibly being polite*. Or so the thought goes. But it isn't enough to characterize modal properties in term of the predicates that express them, at least not for a metaphysical realist. Here is a certain ambiguity in the nature of modal properties; for a modal property could either be one of the two following things.

a) A property that the object does not have, but could have. To be modalized, technically speaking, is the instantiation of the property by the object; thus, even if the correspondent modal predicate is satisfied by the object, there is no (actual) occurrence or instantiation.
b) A property that the object actually has, but that merely qualifies it in a modal way; it only has "modal content". This version of modal property resembles Cambridge properties such as *being such that Jack is tall*. Suppose that John has that property; it thus is a property *of* John, even if the property is ultimately about Jack –it is qualifying Jack. In a similar way, modal properties (b) are actually had by something, but describe how the object could be, instead of how it actually is. If one accepts counterpart theory, modal properties really resemble *being such that Jack is tall*, given that John is not identical to Jack; one has a modal property such that something else (its counterpart) bears the de-modalized property.

Given that standard first-order modal logic does not have an apparatus to explicitly represent instantiation, it has some troubles with the distinction between (a) and (b). One may think that *de re* modalities correspond to modal properties (b); e.g., the predicate $<\lambda x.\Diamond P(x)>$ may at first approximation express the modal property *possibly being P*, which sounds very much like a modal property in the second (b) sense. How to express modal properties (a)? One may think that one can express a possible instantiation of, say, P by *a* through *de dicto* modalizations such as $\Diamond<\lambda x.P(x)>(a)$; but this isn't exactly right. To see why $\Diamond<\lambda x.P(x)>(a)$ does not express a possible instantiation of P by *a*, consider the case where *a* is not a rigid designator. In that case, $\Diamond<\lambda x.P(x)>(a)$ claims that at some world w_1 accessible from actuality, there is some x, picked at w_1 by "a", that is P. But this isn't enough

to infer the truth of "a possibly instantiates P" –for this x may not be picked by "a" in actuality –in fact, x may not even exist in actuality.[52] For this reason, I will not resort to modal logic to express the difference between modal properties according to (a) and (b) conception. But we will need to consider both accounts in what follows.

First of all, according to $D_{2.1}$+(a), R-powers are modal properties that the object could have, but does not actually have. A problem of this account is that, if we restrict our quantifiers to actuality, there wouldn't be any powers at all (or perhaps there would be, even if they are not actually instantiated –that would depend on the underlying theory of properties). This metaphysical divide between the categorical and the dispositional, is a divide between the actual and the merely possible; more precisely, a divide between actual and merely possible property instantiations.

What about $D_{2.1}$+(b)? The reasoning here is slightly more complicated. Here, true dispositional ascriptions resemble true ascriptions of physical vectors such as *force* and *velocity* at certain instants: they do not qualify the subject at the same specific point (in the modal or temporal dimension) of the ascription –but at some other point. They actually ascribe something to their bearer even if what is (actually) ascribed does not actually qualify the bearer in any way. Perhaps David Armstrong had a similar conception of a power as a modal property when he described it as a "congealed hypothetical fact or state-of-affairs" (Armstrong 1997: 79); that is to say, by way of a modal property (b) a possibility of the object, or a counterfactual that holds of it, is "congealed" into one of its actual properties.

There is, I believe, a natural tendency to slip from the (b) to the (a) conception, independently from whether one is realist or antirealist about powers. If one has an abundant conception of properties she will probably not be bothered by the (b) account of modal properties: in fact, there are "modal predicates" like $<\lambda x.\Diamond P(x)>$ and the English counterpart *possibly being polite* (although I would hesitate to call the latter "natural language"). Yet, as in the case of *being such that Jack is tall*, or attributions of *instantaneous velocity*, on a more sparse conception of properties, one might want to exclude such things from the ontology, in favor of a more deflationary approach. After all, it seems that, if someone has the property *being such that Jack is tall*, what is really going on is that Jack has the property *being tall*. If something has a certain *instantaneous velocity*, what is really going on is that it is travelling a certain distance in a certain timespan. And similarly, if something is *fragile*, what is really going on is that it could break if struck, or that it is possible that it breaks.

That being said, how is it that the $D_{2.1}$ conception of powers, according to both (a) and (b), turns them into "occult" and mysterious entities? First of all, it is not hard to see what a metaphysician of neo-Humean sympathies would find problematic in a $D_{2.1}$+(b) conception of powers *qua* modal properties, which afford this very peculiar kind of "qualification at a distance" (so to speak). For according to Hume, *Treatise* (Book I, Part III, Section XII): "there is nothing in any object, consider'd in itself, which can afford us a reason for drawing a conclusion beyond it"; however, according to $D_{2.1}$+(b), an actual instantiation of a power by an object would (unacceptably) result in a qualification of the object at an entirely different point of the modal space.

No such difficulty troubles the $D_{2.1}$+(a) conception of powers; according to it, powers are modal properties in the purest sense of the world: for no property is actually assigned to the object; according to $D_{2.1}$+(a) to have a power to M if S is merely for it to be the case that the object would M if S. The $D_{2.1}$+(a) divide between dispositional and categorical properties is the divide between actual and merely possible, or counterfactual, property instances. It is not neo-Humean metaphysical sensibilities here that rule against $D_{2.1}$+(a), but a Quinean "prejudice for actuality" that was shared by many enemies of

[52] A first-order modal language with an explicit predicate for instantiation could probably deal with this complication in some way or another. As interesting as it is, I will not pursue this matter.

powers. For many of them were "actualists" (in a very rough characterization of the term, according to which everything –unrestrictedly– is actual); and if the divide between dispositional and categorical properties was to be understood as the divide between respectably actual property and property instances, and merely possible property instances or counterfactual state-of-affairs, then it meant that one side of the divide –notably, the dispositional one– was completely empty. This is again a line of thought that is not explicitly presented by foes of powers; but it is somewhat easy to detect; see for example Armstrong (1969: 24) passage I quoted above; or, for another example, consider how Ryle (1949: 103-104) claims that to take dispositional words at face value would mean to take them to express "limbo facts", that is to say "things existing, or processes taking place, in a sort of limbo world."

We have seen a variety of reasons to be skeptical of R-powers as qualified by $D_{2.1}$, in both of its variants. But these philosophical worries can, and in fact did, ignite two kinds of opposite reactions in foes of powers. The first reaction consists in keeping the $D_{2.1}$ divide between dispositionality and categoricity, and claim that R-powers, "modal properties" as qualified by $D_{2.1}$, do not exist. Usually then the semantics of dispositional truths is modified to stay within the boundaries of M-realism: dispositional sentences are true in virtue of the instantiation of some property –albeit a non-dispositional one. Thus, this brand of antirealism about powers rejects the $D_{1.1}$ semantic divide, according to which dispositional truths do not express facts. This is the reaction that leads to (C) and has been embraced, notably, by David Armstrong. The second, more radical, reaction is to deny the dispositional/categorical divide any metaphysical legitimacy, and deny that dispositional truths report instances of properties, dispositional or not. This is the road that leads to N-O, which is not M-realist, but merely W-realist; according to supporters of N-O, dispositional truths do not express facts ($D_{1.1}$). This has been notably embraced by earlier foes of powers such as Carnap, Quine, Goodman, and Ryle.

Overall, the $D_{2.1}$ divide as a way to discern dispositional from categorical properties, construe dispositional properties (e.g., R-powers) in an highly problematic fashion. Without going in the details of the arguments that foes of powers can offer against dispositionality so understood, it is easy to see recognize the danger of drawing the line between the dispositional and the categorical as the line between the merely possible and the actual; of a similar advice was, for example Mumford (1998: 22), according to which

> "anyone who seeks to defend the dispositional-categorical distinction has either to construe dispositions as mere possibilia, which I think would be a mistake, or to construe the categorical in different terms".

However, there are independent reasons why an R-realist, a friend of powers, may be suspicious of the $D_{2.1}$ divide, especially if stated with the full force of a definition of dispositionality. These are, at the end of the day, the reasons introduced in Chapter 1. No friend of powers should be happy with a characterization of dispositionality in modal or counterfactual terms, if that characterization is meant to be definitional –or otherwise metaphysically significant. Whether or not they are "modal properties" in whatever sense of the expression, R-powers are supposed to ground or explain modalities such as possibilities and counterfactuals; yet this means that they are not themselves possibilities and counterfactuals. But this is exactly what the $D_{2.1}$ divide between dispositionality and categoricity is claiming. More generally, even if all the problems in connecting dispositions to conditionals can be solved, and the biconditional in $D_{2.1}$ is extensionally adequate, we lack a reason for thinking that the account should go in that specific direction, from dispositions to conditionals/modality. Traditionally,

the idea is that modality or counterfactuals are preferable to dispositions, a thought process reconfirmed in more recent times by the abundances of clear intensional semantics for the former, but not the latter. Power realists, however, as we have seen in Chapter 1, have turned the table on this matter; for them the account should go the other way: to be explained is modality and counterfactuals –and powers are doing the explaining. Therefore, one who wishes to argue for a more robust account for powers should claim that, so to speak, the reality of powers is not exhausted by modality, that is to say, by what the object could or would do in certain circumstances. A power realist will want to claim that to qualify something through a disposition is to express a way in which it actually is –a dispositional way–, and not just a way it could or would be in certain circumstances. In light of these observations, the dispositional/categorical divide, as a metaphysical divide, should not be crudely drawn as $D_{2.1}$ suggests.

Then, what about dispositionality? Which this dispositional "actual/positive content" of dispositionality is, we still do not know. Keep in mind, however, that it need not be the (categorical) base of the power, albeit this is an intuitive thing to think. One could claim that, e.g., the actuality of a *fragility* ascription is exhausted by the crystalline microstructure: everything else are just conditionals, or possibility. Yet this would still amounts to claiming that powers *per se* are possibilities or counterfactuals, grounded in more respectable properties of the glass. Yet it is metaphysically possible, if not actually true, that there are baseless dispositions (in a causal and metaphysical term); that do not have those "crutches", and which are still actual.[53]

4. A second metaphysical divide

For a metaphysical realist, $D_{2.1}$, as problematic as it was for a friend of powers, was an improvement over D_1, as it ultimately tried to track a semantic distinction down to its metaphysical roots. Let us see if we can do better.

Here is another lead. Remember that the conditional entailment (where "entailment" is itself merely a material conditional) is not sufficient to isolate dispositional predicates or properties, at least if we consider paradigmatic examples. If an object is spherical (it has the property *sphericity*, or the predicate "is spherical" applies to it) then it would roll on an inclined surface; yet sphericity is paradigmatically considered to be a categorical property. And the same trivially applies across the board –every property instance or predicate ascription entails some conditional. The solution that I have introduced before consists in a modal strengthening. When I was discussing $D_{1.1}$ as a divide between predicates, the modality at play was conceptual necessity. E.g., the concept of sphericity does not conceptually entail that a spherical object rolls on an inclined surface, at least not with the same strength in which the concept of *fragility* entails that the object would break if struck.

Perhaps, substituting conceptual modality with another modality proper to metaphysics, something similar can be said about the properties of *sphericity* and *fragility*. That spherical objects roll on an inclined surface does not seem to be a necessity –but rather something that depends on which laws of nature happen to hold at that world –in this case, which principles of gravity. In other possible worlds, spherical things may not roll down inclined surfaces. More generally, the <input/output> stimulus/manifestation pair(s) associated to certain properties like *sphericity* –if any– appear to change

[53] I would like to add, perhaps somewhat prematurely, that a dispositional property brings actuality and reality to its bearer *in virtue of its being dispositional*. Dispositionality does not need metaphysical crutches, neither external (other properties, viz., categorical bases) nor internal (other 'aspects' or elements of the same property). I will come back to this in Chapter 8, when I will discuss the Powerful Qualities view.

from circumstance to circumstance. On the contrary, it would seem that fragile things behave in the same way in all possible worlds in which they exist, and in which they are fragile. More generally, they are properties that are necessarily associated to some stimulus and manifestation. In the terminology introduced in Chapter 3, R-powers, and R-powers alone, necessarily confer the W-powers they actually confer to their bearers; whereas categorical properties may confer others, should the laws of nature change.[54]

> $D_{2.2}$) P is a dispositional property iff F necessarily confers the W-powers it actually confers to its bearers

I will not lay down a more technic formulation of $D_{2.2}$; I don't think it matters all that much. According to $D_{2.2}$, a property is disposition (an R-power) if and only if it necessarily makes the bearer so-and-so empowered, no matter the circumstances or possible world in which the instantiation takes place. Categorical properties are then defined by negation; a categorical property may, or may not, make the bearer so-and-so empowered, depending on the circumstances. This might be an inviting way to understand "dispositional essentialism" –the claim that there are properties with a dispositional essence– as the natural continuation of those "causal structuralist" views of properties according to which properties *necessarily* play the nomic and causal roles they play. For it is easy to reconstruct the central claim of neo-Humean foes of powers, categorical monists supporters of C, as the claim that there is no necessary correlation between how an object is, and how it is disposed to behave (e.g., Ellis 2001). In my terminology, this is equivalent to the claim that there is no modally strong correlation between the properties of an object, and the W-powers it is imbued. Alexander Bird might had something in the vicinity of $D_{2.2}$ in mind when he wrote, in Bird (2007a: 66):

> "What we mean by 'categorical' must be understood in negative terms. That is, a categorical property does not confer of necessity any power or disposition. Its existence does not, essentially, require it to manifest itself in any distinctive fashion in response to an appropriate stimulus (Armstrong 1997: 80-3). The categorical versus essentially dispositional distinction is a modal one."

Bird did not retract from this position, and later on, in Bird (2016: 345) he admitted that although "[t]here is not unequivocal agreement on what exactly a power is", the most common characterizations ultimately point towards what he calls a "necessitarian conception of powers", based on their "modal fixity". In his words (Bird 2016: 346), a power "could not have a different dispositional character or causal role: that character/role is fixed across possible worlds."

Claims like these are somewhat common in the literature. Unfortunately, there are reasons to think that modality is too weak a tool for the $D_{2.2}$ distinction to work as intended. First of all, there are the doubts about modal definitions offered in Chapter 2; many possibilities and necessities in the world stand in the need of explanation, thus it may ultimately be that the "modality fixity" of powers, to use Bird's expression, is a symptom, rather than the source, of a property's dispositionality. This is not an argument, of course, and just a worry. However, here is an argument to the conclusion that $D_{2.2}$ is not

[54] Does this mean that W-powers are necessarily grounded by R-powers (according to power realists), but only contingently grounded by categorical properties (according to their adversaries)? What kind of grounding relation is at play here? I will come back to this in Chapter 9, where I will explain that the crucial difference here is the difference between *total* and *partial grounding*. For power realists, a R-power is all that it take to make something so-and-so empowered; whereas for an antirealist some other ingredient is needed, perhaps a law of nature.

the right way to set up the divide, and that the aforementioned modal difference in the way properties confer W-powers to their bearers (viz., the way in which they make their bearer so-and-so empowered) is not sufficient to tell apart dispositional from categorical properties. Relatedly, the "essentialism" in "dispositional essentialism" should perhaps not be read in a modal sense.

The reason is very simple –and it is a point that will be very important later on in the thesis. According to $D_{2.2}$, it is only a contingent matter than an object which has such-and-such categorical property is so-and-so empowered; this was an acceptable –maybe even welcomed- conclusion for many supporters of C (Categoricalism), usually neo-Humeans philosophers who took laws of nature to be contingent (David Armstrong is the first that comes to mind). But that laws of nature are contingent, doesn't seem to be mandatory for a supporter of C; for why couldn't a categorical monist, viz., a philosopher who believes that there only are categorical properties, believe that laws of nature are necessary –whichever the source of that necessity?[55]

Thus, under the assumption that laws of nature are necessary, $D_{2.2}$ turns all properties into powers-indiscriminately. It would be unwise to consider this a victory of power realism of the monist variety; for the discriminating factor here would be the modal status of laws, which is, I repeat, an independent factor. In other words, $D_{2.2}$ requires friends of powers to hold that laws of nature, if anything at all are necessary (which doesn't seem too heavy a burden) –but it also forces foes of powers to claim that they are contingent. $D_{2.2}$ would turn all ontologies with necessary laws into power ontologies, which seems an unwarranted conclusion. This problem in the $D_{2.2}$ version of the dispositional/categorical divide is not always perceived since, again, the categorical monist of Armstrongian sympathies is often quite content with the contingency of natural laws, and happy to claim that categorical properties are those, unlike dispositional properties, that only contingently behave so-and-so in certain circumstances. But a problem not usually perceived is still a problem.

5. A third metaphysical divide

5.1 A difference in identity

Third time's the charm. We now arrive to the $D_{2.3}$ metaphysical divide between the dispositional and the categorical, which will be my tentative mark of the dispositional for a good portion of this thesis. I have claimed in Chapter 3 that an inviting thought is that the mark of dispositionality, isolating R-powers as genuine dispositional properties, has something to do with their identity, or nature. Therefore, a line of thought could be the following: if a necessary relation is not enough to highlight the special relation that genuine powers have with their <input, output> specification pair(s), perhaps this may mean that this link is even more intimate than that. It may be claimed that dispositional properties have their identities fixed by their stimuli and manifestations –roughly speaking, they are the properties they are in virtue of what they are powers *for*. On the contrary, categorical properties, even if they are necessarily associated with such stimuli and manifestations (in the case of necessary laws), are not so intimately linked by them. *Sphericity* may, on some assumption, necessarily make it so that spherical objects are disposed to roll on inclined surfaces. But it is not its nature: it is not what sphericity is.

I will present more details about $D_{2.3}$ in Chapter 7, when I will be dealing with a variant of power realism that explicitly embraces it. But the underlying idea, which can be traced back to Shoemaker

[55] See Chapter 9 for a more detailed presentation of Categoricalism paired with necessary laws. The first in recent literature to explicitly point out that categorical properties presumably do not need to be accompanied by a deeply contingent metaphysics was perhaps Schaffer (2005).

(1980) and Hawthorne (2001), is that a dispositional property is one whose identity is fixed by its dispositional profile (its <stimulus, manifestation> pair(s)), or alternatively, its causal or nomic roles –it is assigned such roles not only contingently, and perhaps not even just necessarily, but essentially. On the contrary, a categorical property has a primitive source of identity, sometimes called a quiddity; sometimes categorical properties are called *quiddities* themselves. Usually (but, as we have seen, not always), this means that a categorical property, a quiddity, is only contingently assigned its dispositional profile, causal and nomic roles; therefore one cannot re-identify a property by observing its discernible behavior in a given circumstance. Thus, we obtain:

$D_{2.3}$) P is a dispositional property iff its identity is fixed by its <stimulus, manifestation> pair(s)

On the contrary, categorical properties have primitive identities. Please note that this is not a definition by negation, insofar as there are many ways in which a property may have a non-primitive identity: the route offered by the dispositional side of $D_{2.3}$ is only one of many. *Prima facie*, however, it would seem that dispositionality and categoricity are mutually exclusive: if the identity of a property is specified in terms of how it disposes something to behave, then its identity is not primitive; and vice versa. I will come back to this topic in later Chapters.

Let us take stock. The move from D_1, a semantic distinction, to $D_{2.3}$, a metaphysical one, suggests that conditional entailment is, if anything at all, a symptom of dispositionalit, rather than its source. For someone may claim that it is because some properties are genuinely dispositional in nature that their ascription entail some conditional or another; conditional entailment, and the holding of some possibility, is a modal consequence of a power, a feature of a certain kind of property, being possessed by its bearer: it is not what the power consists in.

5.2 Meet dispositional directionality

The dispositional profile of a property usually involves one or more stimulus/manifestation pairs: they are, according to $D_{2.3}$ what fixes the identity of a genuinely dispositional property. Following the lead in Bird (2007b) I will, for reasons of brevity, consider only the manifestation as characterizing dispositions; this doesn't mean, mind you, that I agree with Vetter (2015) according to which manifestations alone identify dispositions –even if, were that to be the case, it would involve a significant philosophical simplification.

Thus, each dispositional property essentially selects a manifestation that identifies it; this phenomenon is what I will call *dispositional directionality*. Under a particularly radical interpretation of $D_{2.3}$, dispositional directionality, viz., the essential pointing of each power to its manifestation, is the true mark of the dispositional, what constitutes the nature of a R-power. For this definition of dispositionality, see Mumford (1999) and Molnar (2003). Similarly, Armstrong (2005: 315) claims that a power is "essentially something that points to a certain effect". Additionally, someone, as we will see at length in due time (e.g., Bird 2007a, 2007b) might go as far so as to claim that the dispositional nature of the most fundamental properties is relational –and is constituted by instances of this directionality relation. According to this conception, what God really added to the world when He intended to make a powerful world, were instances of this directionality relation.

As we will see, many power realists do not take the phenomenon of dispositional directionality to be metaphysically genuine, and present many arguments against its supporters. Thus, this interpretation of the $D_{2.3}$ (and, to some extent $D_{2.3}$ itself) is not uncontroversial. Dispositional directionality will be the

topic of the Chapter 6; I will present arguments for and against it –but we will need to wait Chapter 7 to obtain a full evaluation of dispositional directionality *as the mark of the dispositional*.

5.3 About categoricity

We now have some grasp on the notion of dispositionality, through $D_{2.3}$. What about categoricity? Is $D_{2.3}$ all that there is to the dispositional/categorical divide –and more, specifically, is it all that there is to categoricity? According to $D_{2.3}$, categorical properties are simply those that are essentially inert and self-contained. Yet the notion of categorical property usually employed in the literature is much richer than that, albeit vaguely and problematically so. In this section I will present some additional nuance to the notion of "categoricity" of a property, and their relevance to the discussion; some additional details on this matter will be provided throughout Chapter 8.

One way to explore how categorical properties have been understood, consists in considering the various arguments against *pandispositionalism*, or *dispositional monism*, the thesis that there only are dispositional properties (viz., all properties are R-powers). They are usually formulated in the form of a regress, to the conclusion that a world of powers only is a world sorely lacking *something*… that categorical properties would provide. There are many of them. To be precise: these regress arguments do not interest me as arguments against pandispositionalism; pandispositionalism is not the issue here. They are rather of interest because they betray some antirealist assumption on what categorical properties supposed to be, that powers cannot provide on their own. Here are some of these regress arguments, and the corresponding notion of categorical properties that they urge us to accept.

1) The first regress argument would be Swinburne's (1980) epistemological regress. According to it, powers are indirectly accessible through their manifestations. But if all manifestations are in turn powers, or the acquiring of another power, no property ascription is epistemically accessible, and perhaps unverifiable. Therefore, the world cannot be made just be powers but needs "categorical" properties –in the sense of immediately accessible properties.
2) An actuality regress argument. According to Armstrong:

> "Can it be that everything is potency and act is the mere shifting around of potencies? […] Given a purely Dispositionalist account of properties, particulars would seem to be always re-packing their bags as they change their properties, yet never taking a journey from potency to act. For 'act', on this view, is no more than a different potency."[56]

   In short, a world with only powers –viz., modal properties–, would be a world without actuality. Therefore, we need "categorical" properties –in the sense of actually instantiated, non-modal properties.
3) An identity regress argument. Lowe (2006) argued that, if power get their identity from their manifestations, but all manifestations are in turn powers, no power would ever get its identity fixed. Either powers are infinite in numbers, so there is an infinite regress in the operation of identity-fixing, or they are finite, and there is a circularity. It is assumed that, in the case of identity (as for determination), both cases would be vicious Therefore, Lowe (2006: 138): "no property gets its identity fixed because each property owes its identity to another". Therefore, the world needs "categorical" properties in the sense of properties with an intrinsic self-contained nature involving no possible behavior or outcomes.

[56] Armstrong (1997: 80). But also see Armstrong (2005: 314).

4) Somewhat more elusively, a being or reality regress argument. A world with only powers, and in which the manifestation of powers would only be a "passing of powers around", would be no world at all –or, at best, a completely empty world.[57] One the face of it, this is a confusing line of reasoning; as one might legitimately wonder why exactly why one needs (non-dispositional) properties in order to have objects. An helpful consideration could be the following: given that each power is essentially directed to its manifestation, the being and reality of a power depends on such manifestation. But if all manifestations are in turn powers, no "being" is ever achieved. If, in turn, objects are nothing but clusters of powers, they would turn out to be extremely insubstantial. This might have been the point of Campbell's (1976: 93) criticism of Boscovich's atomistic theory of material points with no shape, mass, or volume, characterized only in terms of their ability to move with one another according to a law of attraction and repulsion:

> "I doubt very much whether it is possible for everything to be constituted by nothing but causal powers. But that seems to be the situation in Boscovich's system. When one points move another, all that has been shifted is a power to shift powers to shift... But powers to shift what?"

According to this set of arguments, the world cannot consist in just powers, but needs "categorical" properties", in the sense of self-contained properties that do not require other properties of object in order to exist or have a nature.

I introduced these arguments not to fully evaluate them, but to understand what is it that they call for, through "categorical" properties, that dispositional properties cannot provide by themselves. Thus, we have identified four additional nuances to the notion of a "categorical property". But how relevant are they for our current goals? First of all, categorical properties in the (2) sense do not seem to be that vital to have in one's ontology, given that, as we are now in a position to see, the whole argument in (2) is based on the wrong understanding of powers as "modal properties", according to $D_{1.2}$. As recognized in Mumford (2004: 174), dispositional properties are perfectly actual, unconditional ascriptions; they do not need external crutches to provide actuality to the world. However, "categorical" properties according to (1), (3), and (4) may be more important. With the goal in mind to evaluate a variant of power realism which may be compromised by such regress arguments, I will discuss (3) and (4) in Chapter 7. The overall conclusion of those arguments, if taken at face value, is that we need properties with an inert and self-contained nature to end those problematic regresses.
In this thesis, I will not engage with the epistemological problem presented in (1). For one, this thesis does not directly engage with the epistemology of dispositions; furthermore, Tugby (2014) convincingly argues that, in these matters, categorical and dispositional monism are on the same boat, thus effectively making the epistemology of properties a non-factor in the choice between them.

6. Power ontologies: the road ahead

We now have some tentative grasp of the notion of dispositional and non-dispositional "categorical" properties. And we have discussed, by introducing N-O, NM, and C, all major positions denying, in some sense or another, that there are dispositional properties. What about the others? What variants of realism about powers –viz. R-realism– there are?

[57] Campbell (1976: 93), Robinson (1982: 114-115), Heil (2003: 98/108). But also see Molnar (2003: 176).

First of all, there are those who believe that there are both dispositional and categorical properties; they are called *Dualists* (D).[58] Dualism is the only position according to which the dispositional/categorical divide effectively separates two distinct kinds of properties in the world. As with all kinds of dualisms, one very serious problem with this position is that it must present a convincing non-overdetermining causal story that comprises both kinds of properties –a task made more challenging by the fact that one of them (the dispositional ones) is so closely connected to causation. I will not explicitly discuss D further (although it will come back occasionally). D is not a thesis about the nature of dispositionality, or the set-up of dispositional properties, but only about how many, and which, kinds of properties exist; and thus, it is not one of the primary concerns of this thesis.

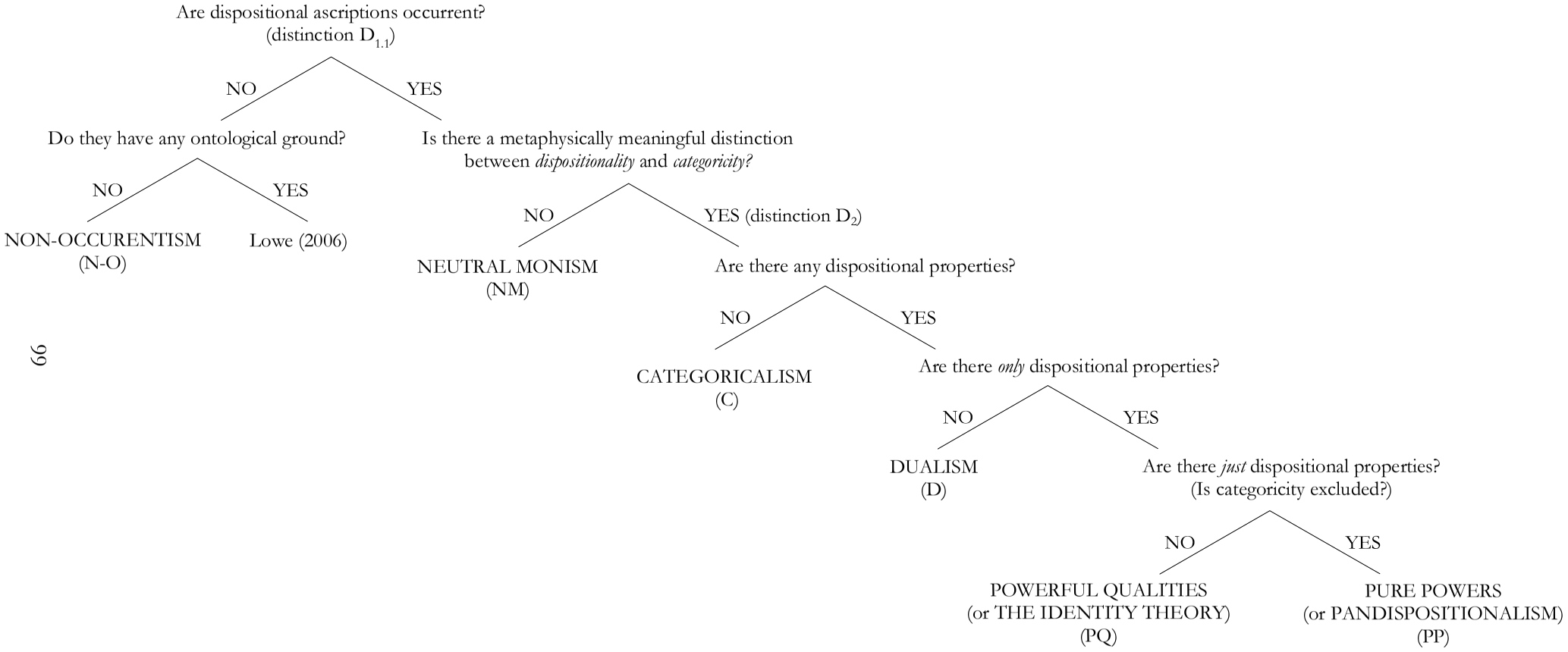
If one denies both C and D –viz., if one claims that there are no two kinds of properties, and that there are R-powers– then one accepts that all properties are dispositional in character. But this is not the end of the story. For another question needs now to be answered about the nature and intrinsic make-up of those dispositional properties. Are those properties *just* dispositional, exhausted by their dispositionality? Or are they categorical *as well*? Relatedly, are categoricity and dispositionality mutually exclusive? This introduces the distinction between the Pure Powers view and the Powerful Qualities view. However, as the reader will soon understand, both positions are far more complex than a positive or negative answer to those questions, and their opposition is far less clear than I made it out to be (for heuristic reasons).

The basic idea, however, is that for some philosophers, R-powers are exhausted by their dispositionality. They are just powers. This is the so-called Pure Powers view (PP). This is the "purest" and most radical power ontology. Not only there are powers, but they aren't anything but powers, and there is no other kind of property. Supporters of PP usually embrace the $D_{2.3}$ divide, and some of them take dispositional directionality to be a somewhat legitimate phenomenon. PP will be evaluated in Chapter 7. Relatedly, Chapter 7 will deal with dispositional directionality taken as the mark of the dispositional.

According to others, on the other hand, properties are both dispositional and categorical. This is called Powerful Qualities view (PQ), also known as "Identity Theory" in virtue of the "surprising identity" (Martin 1997) posited between the dispositional and the categorical. PQ is a particularly delicate position, insofar as it claims that dispositionality and categoricity are not mutually exclusive; supporters of PQ usually ignore $D_{2.3}$ and dispositional directionality –but it is far harder to understand what they mean exactly when they claim that properties are "dispositional" or "categorical". PQ will be the focus of Chapter 8.

In short, the most important respect in which PP and PQ disagree, as versions of R-realism, is the treatment of the relational element of directionality or "pointing to" a manifestation. It is therefore the clearest example of two positions agreeing that there are dispositions (in the sense that there are R-powers), and yet disagreeing on what dispositionality is. Is their agreement on the existence of R-powers therefore in danger? Possibly, as I will discuss in Chapter 9.

[58] Ellis (2001), Molnar (2003). I was originally tempted to call this position "the mixed view", following the terminology in Bird (2007a, 2016); unfortunately, Ingthorsson (2013) uses the same term to refer to a different position, which we will see shortly: Powerful Qualities. Both positions are "mixed" in the sense that they accept the reality of both the dispositional and the categorical, and yet differ on whether they reside in a single property or not. Thus I will avoid to use this expression.


Are dispositional ascriptions occurrent?
(distinction $D_{1.1}$)
NO
YES
Do they have any ontological ground?
Is there a metaphysically meaningful distinction between *dispositionality* and *categoricity?*
NO
YES
NON-OCCURENTISM
(N-O)
Lowe (2006)
NO
YES (distinction D_2)
NEUTRAL MONISM
(NM)
Are there any dispositional properties?
NO
YES
CATEGORICALISM
(C)
Are there *only* dispositional properties?
NO
YES
DUALISM
(D)
Are there *just* dispositional properties?
(Is categoricity excluded?)
NO
YES
POWERFUL QUALITIES
(or THE IDENTITY THEORY)
(PQ)
PURE POWERS
(or PANDISPOSITIONALISM)
(PP)

CHAPTER FIVE
THE INTRINSICNESS OF POWERS

1. Introduction

According to Lewis (1997: 147) powers are "an intrinsic matter".[59] This seems *prima facie* true. Without providing a complete definition of intrinsicness (and relying on the tentative understanding provided in Chapter 2), it would seem that how an object is empowered merely depends on how it is –rather than the environment it finds itself in; and similarly, it would seem that perfect physical duplicates are empowered alike. For example, a perfect physical duplicate of a fragile glass is most likely to be fragile as well.

The thesis that powers are intrinsic (in what follows, IP) seems to be especially inviting for friends of powers; a foe of powers, say, a Categoricalist, will probably hold that how an object is empowered depends on both the categorical properties it possesses, and which laws of nature happen to hold at that world. This limits the intrinsicness of powers; for, say, the perfect physical duplicate of a fragile glass may happen to exist at a world in which the laws of nature are different; thus, it would not be fragile.[60] Lewis (1997: 147-8) claims, to be more exact, that powers "are an intrinsic matter […] Except perhaps in so far as they depend on the laws of nature". No such complication troubles the power realist, who is free to accept IP without qualification.

The claim that powers are intrinsic interacts in a complicated way with the claim that the mark of dispositionality is a relation of *dispositional directionality*; an argument presented in the next Chapter revolving around this topic presents an assumption that crucially depends on the intrinsicness of powers. In this somewhat briefer Chapter, I discuss IP in the light of some counterexamples. For even if IP is held in high regard by a great number of philosophers, there appears to be huge variety of alleged counterexamples to it. And there is, after all, a vigorous philosophical tradition –well-documented in Langton (1998)–, which takes powers to be extrinsic and/or relational features of an object.

To defend IP from counterexamples, I will deploy many philosophical tools introduced in this thesis so far. My general strategy consists in claiming that all alleged extrinsic powers are actually extrinsic W-powers, so, not really powers. This leaves it open for a power realist to claim that extrinsic W-powers may correspond to extrinsic R-powers, thus, genuinely extrinsic dispositional properties. But I will also claim that such entities would be highly superfluous in a power realist's ontology. Finally, I will offer some considerations on the nature of interferences.

2. The context-sensitivity of power ascriptions

First of all, it seems that more often than not, ascriptions of powers are context-sensitive. The same item might be considered fragile, or not fragile, depending on the circumstance of the utterance. For instance, I might not consider a wooden table as fragile in the context of my office (as there is no way I could break it with the tools I have there), but I might consider it fragile on a building site (as I cannot put too many concrete blocks on it, I cannot use it to smash down walls, etc…). If one were to simply

[59] Similarly, e.g. Johnston (1992: 234), and Molnar (1999: 3, 2003: chapter 6).

[60] Again, what if laws of nature are necessary? Here perhaps we should understand the dependence of powers from laws of nature in a more-than-modal fashion, as I did in my characterization of intrinsicness through grounding presented in Chapter 2.

ignore this fact, one would most likely trivialize all dispositional ascriptions, and at the same time, allow for contradictory ascriptions.

Context-sensitivity would seem to immediately disprove IP. In fact, assuming that "fragile" refers to a genuine power, two physical duplicates, situated in different contexts of ascription for "fragile", might differ with respect to it. This difficulty is however merely apparent. Consider the two tables that are perfect physical duplicates, but one, which is said to be "fragile", is in a building site, while the second one, which is not said to be "fragile", is in my office. Not only the two tables share the same intrinsic properties, but they clearly share the same dispositions as well –at least relatively to their fragility. It's not like the "not fragile" office table is disposed to withstand a concussive shock that would break the "fragile" table in the construction site. In fact, when we grant the second one the label "fragile" we are not thinking at the same kind of behavior that would make us deny the same label to the first. Therefore, ascriptions of "is fragile" are context-sensitive not in the same sense in which "is 5 miles away from Paris" is (viz., in the sense that it expresses an extrinsic property); it rather is context-sensitive in the sense that it expresses different properties in different contexts, and this is why its satisfaction conditions differ from case to case. This is easy to understand once we consider that powers come in degree, and can be subject to comparative claims. An engineer might be considering an old and consumed sledgehammer as fragile, but the sledgehammer is surely less fragile than the wooden table in my office, which I do not regard as fragile (Bird 2007a: 20). The sledgehammer is considered not simply fragile, but *too* fragile (for the work it is supposed to do); as the table in my office, I regard it as *not enough* fragile (to treat it with caution as I would do with a glass). This means that usually (Vetter 2015: 21) "whether something counts as *fragile* in a given context is a matter of *how* fragile it is, context setting a minimum degree which needs to be satisfied for the predicate to be true of a thing."

This transpires even more clearly once we consider (as in Chapter 4) that powers get their identity from their stimuli and manifestations. We can see that the property assigned to the "fragile" table at the construction site is not the same property denied to the not-"fragile" table in my office, for they are associated different <input,output> parameter pairs –at least, they are associated parameters of different degrees. The same quantity of physical force is required to smash them both –yet different quantity of physical force warrant them being called "fragile" in the relevant context. Therefore, the context-sensitivity of dispositional ascriptions should not be considered counterexamples to IP.

3. Extrinsic powers

3.1 The invulnerable city

Context-sensitivity out of the way, however, it is not hard to find counterexamples to IP. McKitrick (2003) offers a good number of them; paradigmatically, a city can be said to be vulnerable, or contrariwise invulnerable in virtue of external environmental factors, such as a defence mechanism located outside of it. A city so protected from physical harm would be invulnerable, but that invulnerability would most likely count as an extrinsic property (e.g., it cannot be had in isolation, and it is not shared by a non-protected physical duplicate of the city). Before discussing the example, let me clarify two points.

First of all, someone may object to McKitrick's conclusion that vulnerability is extrinsic; what the example rather shows, one could say, is that vulnerability can be had extrinsically. A city may in fact be invulnerable in virtue of a defence system located inside of it (not merely in a spatiotemporal sense of "inside of it"; what I mean is that the defence system is part of the city); thus, it would be intrinsically invulnerable. Or, a city may possess two defence systems, one inside and one outside –thus, it would

possess invulnerability both intrinsically and extrinsically (Bader 2013 discusses an hyperintensional account of intrinsicness that allows for properties to be had in both ways simultaneously). That being said, I claimed in Chapter 2 that one commonplace way to clarify the relation between "intrinsic properties" and "properties that are had intrinsically" is to claim that intrinsic properties are all and only those that can only be had intrinsically –whereas extrinsic properties can be had both intrinsically and extrinsically. Thus McKitrick's example would still count as a counterexample to IP, as it shows *invulnerability* to be an extrinsic property, which however can be had intrinsically.
Secondly, here is another trouble that McKitrick does not consider. One may legitimately wonder why that, and many other similar cases, would count as a case of extrinsic power and not as a case of mimicking, e.g., a case in which environmental factors simulate the presence of a power that is in fact not there at all; for it may be said, in McKitrick's case, that the defence system located outside of the city is not imbuing it with invulnerability, but merely simulating its manifestation –that is to say, a lack of physical harm inflicted to it. Contessa (2015), discussing a partially unrelated topic, similarly urges us to consider the difference between *extrinsic dispositions* and *mimicking interferences* –albeit exactly what this difference consists in, is hard to say. I will not pursue this suggestion further, mostly for two reasons. First of all, setting up the right distinction between extrinsic dispositions and mimicking interferences would sidetrack us too much; secondly, if one's goal is to defend IP, one can only hope that the right distinction will classify any and all alleged counterexamples to it as cases of mimicking interferences. This strategy is, as of now, a very long shot –and, as I now pass to explain, not one that I need to take.

I could simply accept the fact that some powers are extrinsic; the rest of the thesis should work just as well under the assumption that many, or even just some, powers are intrinsic; after all, the counterexamples offered by McKitrick appear to be somewhat limiting cases that do not affect paradigmatic examples of dispositional properties (e.g, fragility, elasticity, electric charge, etc). However I would like to offer the following consideration in defence of IP: the most common counterexamples offered against IP do not involve R-powers, but merely W-powers. This may be true in the case of McKitrick's counterexamples as well. McKitrick (2003: 156-8) presents some mark of dispositionality to help her individuating dispositions in her quest for extrinsic ones. It's hard to reach an agreement, since (of course) her mark of dispositionality does not align perfectly with the taxonomy that I produced in Chapter 3 –and even harder since she doesn't claim her mark to constitute necessary or sufficient conditions for being a disposition. However there is some ground to the claim that the dispositions involved in her counterexamples to IP are in fact W-powers. In her words: "when someone is prone to act in certain way in certain circumstances, she has a disposition", and shortly after, "the supposition that overtly dispositional locutions refer to dispositions is a good rule of thumb". The reader will remember that W-powers are merely the result of disquotation principles, e.g.:

> W_1) Socrates has the W-power to play music iff "Socrates has the power to play music" (or "Socrates is disposed to play music") is true

Thus, Socrates has the W-power to play music if and only if it is the case that Socrates is disposed to play music. All in all, such entities do not sound that much different from McKitrick's dispositions. Therefore, all that her counterexamples would prove is that some situations feature extrinsic W-powers; but whether they are underpinned by proper extrinsic R-powers, genuine extrinsic dispositional properties, is left open. McKitrick (2003: 167) anticipates a somewhat similar objection, according to

which "in the purported example of extrinsic dispositions, some underlying intrinsic dispositions are really doing the work". Her response is that (ibid.):

> "Even if extrinsic dispositions derive from, depend on, are less important or less explanatory than intrinsic dispositions, that is no threat to the claim that some dispositions are extrinsic."

That is however too optimistic on her part. On the contrary, if it is true that the dispositions she is dealing with are W-powers, her counter-objection fails. For W-powers, as I discussed in Chapter 3, are not powers at all. They are merely the result of disquotation, and everyone accepts their existence and instantiations by object (according to principles such as W_1), friends and foes of powers alike. If the only reason why a disposition of invulnerability is assigned to the city is that it is the case that it is invulnerable, that is not sufficient to make sure that we are legitimately dealing in dispositions –intrinsic or extrinsic that they might be. The power realist may, mind you, have such an abundant or "equalitarian" conception of properties according to which every dispositional locution expresses a genuine disposition. In that case, that the city possesses an extrinsic W-power of invulnerability may be taken as a symptom of the fact that the city possesses an extrinsic R-power of invulnerability as well, viz., a genuine extrinsic power. But this is not mandatory. As claimed in Chapter 3, power realism does not impose a bijection between W-powers and R-powers. This means that, without additional assumptions, McKitrick's cases do not clearly individuate counterexamples to IP.

Relatedly, a supporter of McKitrick's proposal may criticize my claim that her dispositions are W-powers. As I said, I'm not so sure of that claim myself. However, she must also offer some evidence to support the claim that her counterexamples, such as the one about the invulnerable city, deal in R-powers instead. For, as I see it, he counterexamples revolve on far too easy exercise of reading ontology (in this case, extrinsic powers) off language. In particular, that the city is invulnerable is not sufficient to infer that the city instantiates a dispositional property of invulnerability.

3.2 The elastic rubber band

Here is a different counterexample to IP. Consider a rubber band that is elastic, viz., that is disposed to stretch and deform when force is suitably applied. This disposition of elasticity, which may *prima facie* appear to be paradigmatically intrinsic, is in fact extrinsic. First of all, it not only depends on how the rubber band is, but also its external surroundings; the very same rubber band, put in a different environment with subzero temperatures would presumably lose its elasticity; in the sense that pulling the band would result in the band flat-out breaking, instead of stretching.

Would this count as an extrinsic property, and thus, a counterexample to IP? Hardly so, for two reasons. First of all, many of the paradigmatic tests for extrinsicness in fact fail; there might be some difficulty in non-circularly selecting a subset of properties shared by perfect physical duplicates in order to define extrinsicness through duplicates, but it's pretty clear that an elastic rubber band, and a (non-elastic) rubber band at subzero temperature, are *not* perfect physical duplicates. And similarly, such a drastic change in temperature would hardly be merely an "external" or "extrinsic" change relatively to the rubber band –it would more likely intrinsically change its internal constitution.

Secondly, again, the claim that the rubber band is elastic is merely sufficient to infer that it possesses a W-power of elasticity –not that it possesses a genuine dispositional property, extrinsic or intrinsic as it may be. Thus, the band's W-power of elasticity may be lost and acquired based on the circumstances, but that merely turns out to be equivalent to the claim that a change in properties in an object may modify the set of dispositional truths about it. This is hardly surprising, and not particularly interesting.

The background metaphysics can still allow for intrinsic properties, and, more specifically, intrinsic R-powers, to be responsible for its elasticity.

3.3 *Hic Rhodus, Hic Salta!*

Here's a simple story from *Aesop's Fables*. An athletes brags about a stunning jumping feat he allegedly performed during a competition on the island of Rhodes. An annoyed bystander challenges him to repeat that jump, telling him "hic Rhodus, hic salta!" (viz., "here is Rhodes, jump here!"); after all, why bragging? If he could perform that jump on Rhodes, he should be able to repeat it right then and there. This story clearly supports the intuition that dispositions, such as the disposition to jump at a certain high are not extrinsic and not do not depend on external factors such as spatiotemporal locations. But a science-fiction twist to the story supports the opposite position. Imagine that the island of Rhodes was on a different planet entirely, with a stronger gravitational pull. In that case, it would be pointless for the bystander to challenge the athlete to repeat the jump, since that may simply be too easy with Earth's weaker gravity. Or, contrariwise, if Rhodes was on a planet with a weaker gravity, the bystander's request would be unfair, since it may impossible to replicate the same jump on Earth.

This suggests another counterexample to IP; let us call J^2 the disposition to jump at least 2 meters high. Some people on Earth are disposed to jump at least 2 meters high, so J^2 appears to have at least some instances. Imagine arbitrary athlete *a* who possesses J^2. Now imagine planet R, a planet suitable for human life, but with a much stronger gravitational pull than Earth, so that any human may barely stand upright. Now, *a*'s physical duplicate on R does not possess J^2. Relatedly, *a* possessing J^2 may not modally rigidly depend on the existence of Earth, but, more generically, on the existence of some planet with a certain gravitational pull –and on the fact that *a* is on its surface. All of this lends some credibility to the claim that J^2 can in fact be had extrinsically, or that it is an extrinsic disposition. This counterexample to IP, unlike the previous one, requires some work to be dispelled.

First of all, consider a human being, called *b*, on planet R, who, summoning immense physical strength, may jump 0.3 meters high. He is therefore disposed to jump 0.3 meters high; he possesses $J^{0.3}$. So we have *a* on Earth, who has J^2, and *b* on R, who has $J^{0.3}$. Imagine you are a realist about powers –who furthermore agrees that humans jumping is the result of some powers they have. There is some temptation to claim that *a* and *b* jumping, even if they jump to different heights, are exercising the very same powers (or at least, different instances of the same powers) –they are just exercising them with different results. That the same power produces different results in different contexts is no philosopher's thought experiment. Part of the scientific endeavor precisely consists in isolating the contribution of the same powers in different circumstances; the textbook case here would be Millikan's oil drop experiment, in which the electron's negative charge is measured through the contribution it gives to the behavior of oil droplets in an electric field (more specifically, a difference in their falling velocity). *Per se*, a power has only a vague and general kind of manifestation, like jumping, that is made specific by the kind of environment in which it is exercised; e.g., Earth's specifies a certain jump height; and planet R, another. This was explicitly noted in Molnar (2003) which called this phenomenon "the pleiotropy of powers" (a term borrowed from genetics). To put it bluntly, powers do different things in different circumstances. Or, to use (Martin 2008: 5) expression, a power is "infinite in its directedness". This idea is sometimes cashed out by power theorists in terms of *power partners* rather than "circumstances"; depending on which other powers contribute in the overall process, the final result will be different (as in Martin 2008: 50). According to Mumford and Anjum (2011: 35):

> "[t]he same power can produce different overall effects depending on which other powers combine with it. Powers can thus have different partners for the production of different mutual manifestations. Depending on its partnerings, heat can produce expansion, explosion, melting, boiling, steam, fever, burning, fire, pleasure, pain, growth, life, death, and so on."

In our jumping scenario, a prominent power partner of a human's power to jump will presumably be some power correlated to the planet's gravitational pull.

That the same power might manifest itself in different way might seem *prima facie* at odds with the idea, introduced in Chapter 4, that powers are identified as being powers *for* some specific manifestation rather than another. Here are two ways around it. First of all, we can follow Molnar (2003) footsteps and keep a one-to-one correspondence between powers and manifestations, but abandon the idea that manifestations are causal effects or going-ons, such as a breaking event or a dissolution process; each power has an individual contribution that is the same in all circumstances in which the power is involved. Thus a manifestation, a contribution, is not the effect, something like an event or an occurrence, but a metaphysically more elusive entity. The final effect, on the other hand, is some kind of "combination" of all those contributions. This suggests a *three-steps model* of power-based causation (power, contribution, final outcome) that has recently gained some traction in metaphysics and philosophy of physics.[61]

Secondly, we could pair each power with a multitude of manifestations, each one of which relative to a specific set of stimuli, circumstances or power partners. This is the so-called *multi-track model*.[62] Perhaps this means that the connection between a power and its manifestation is logically more complex that initially thought –as each power is not only engineered to produce a manifestation, but to do so in certain circumstances, with the help of other powers. Roughly put, you need more parameters to identify a power.

As different as they are, what the three-steps model and the multi-track model have in common is that, the same powers, like a disposition to jump, can produce different results in different circumstance. A third model that does not share this feature, as suggested in the final lines of McKitrick (2010), proposes to keep the original one-to-one correspondence between powers and manifestations, and claim that whenever the circumstances make the outcome change, the interested power changes as well.

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[61] Molnar (2003), Cartwright (2009), Mumford and Anjum (2011), and the contribution of the latter authors in McKitrick, Marmodoro, Mumford and Anjum (2013). For some criticisms to this three-step model, specifically about the notion of *contribution* and *component force*, see Cartwright (1983: 59), Williams (2010: 87-88), and McKitrick (2010).

[62] For the multi-track model, see Ryle (1949: 43–45). More recently, Cartwright (1999: 59, 64), Williams (2011b), and Vetter (2013, 2015). I would like to spend some words on this other parameter –the stimulus parameter. What exactly is it supposed to be? One might doubt that power partners (like the *hardness* of a surface and the *penetrability* of air, in the case of *fragility*, for the manifestation *breaking*) are sufficient to specify a power's condition for activation. After all, all partners need meet to order to interact, which again seems like a stimulus condition. This usually embeds a clause of spatiotemporal proximity or contact; and spatiotemporal properties are a paradigmatic example of properties that cannot be treated dispositionally as partner powers amongst the others. Furthermore, it has been argued that, at the pain of a regress, one cannot simply explain the activation of a power (what a stimulus is supposed to do) by simply adding more powers to the mix: "positing contributing powers does not explain how a dormant power becomes active" (McKitrick 2013: 134). And finally, there are those who believe that stimuli cannot be considered causes, but only necessary conditions for manifestations (Lowe 2011), and those who believe there are no stimuli at all (Vetter 2015).

This third model denies that, when two people jump to different heights, there is no metaphysically interesting sense in which they are exercising the same powers. I will not consider it in what follows.[63]
To be sure, I am not going to decide between the three-steps model and the multi-track model. The fact that these models exist, however, only goes to show that we should be very careful when we exclusively identify and conceptualize a power in terms of a single specific resultant effect it can bring about. According to Williams (2011b: 584):

> "We limit what we take the power to be capable of because we associate with its name a specific manifestation type. But no such association is warranted, and nothing about our grasp of the concept warrants our treating it as having captured the essence of the power so named. Just because we have named the power on the basis of its potential to give rise to one specific manifestation type does not limit it accordingly."

How does this translate to our previous case of jumping on different planets? The jumping power shared by *a* and *b* encodes some kind of mathematical structure, a certain ratio between at least two quantities: the strength x of the gravitational pull acting on the bearer (in Newton), and the minimal or maximal height y of its jump (in meters, or centimeters). If *a* and *b* have equal physical strength (if they would jump the same, were they to be on the same planet), the ratio encoded in their jumping powers is the same. A different type of power, possessed by weaker people, would encode a different ratio. Powers such as these are intrinsic, or at least, there is no counterexamples such as the ones considered above that should make us think that they are not. The transition from an extrinsic power to jump *n* meters (for some *n*) to an intrinsic power to jump *n* meters when subjected to a *m*-Newton strong gravitational pull, mirrors the transition from the extrinsic dispositional understanding of *weight* to the intrinsic dispositional understanding of *mass* (as in Yablo 1999). Weight is gravity-relative in a way that mass is not.
Finally, have reached the conclusion that *a*, on Earth, and *b*, on planet R, are exercising the same intrinsic powers, even if they jump to different heights. But what about our initial dispositions J^2 and $J^{0.3}$? Those are still extrinsic. I submit, again, that J^2 and $J^{0.3}$ are actually W-powers, and not genuine powers; I have merely introduced J^2 once it was settled that *a* is disposed to jump at least 2 meters, and similarly for $J^{0.3}$. But, again, a power realist may not be committed to the existence of a genuine dispositional property of jumping at least 2 meters high. Even if some genuine R-power is responsible for the fact that (and the truth that) "a is disposed to…" and "b is disposed to….", this is fully compatible, as this section has shown, with the claim that such R-power are in fact fully intrinsic, and shared between them. It takes a further assumption –the extremely onerous and highly suspect assumption that there is a bijection between W-powers and R-powers, to accept the existence of two distinct, extrinsic, R-powers corresponding to J^2 and $J^{0.3}$. It is indeed the case that *a* is disposed to jump at least 2 meters high, and that *b* is disposed to jump at least 0.3 meters high; however, as I have extensively discussed in previous Chapters of this thesis, it is a very difficult task to decide which dispositional words actually correspond to dispositions proper.
Furthermore, there are reasons to think that any hypothetical R-power J^2 or $J^{0.3}$ would be completely superfluous entities; for the intrinsic R-power shared by *a* and *b*, –the ones with a certain ratio between determinable quantities– are all that it takes to causally explain *a*'s and *b*'s actions (in their circumstances), and all that it takes to ground the relevant laws of nature (which also display ratios

[63] See Vetter (2015: chapter 2) for an argument to the conclusion that determinable powers like the disposition to jump cannot be completely superseded by determinate powers like J^2 or $J^{0.3}$.

between determinable quantities). In conclusion, the extrinsicness of J^2 and $J^{0.3}$ is no counterexample to IP.

4. Conclusions, and the bigger picture

In conclusion, alleged counterexamples to IP fail to provide genuine cases of extrinsic powers in objects; the reason is that all such cases the presence of an (extrinsic) power is simply inferred by the use of dispositional words, either in an object-language or in a philosophical metalanguage. A city externally protected by a missile system may surely be taken to be invulnerable –and extrinsically so- but that is not sufficient to infer (not even for a power realist) that the city has an extrinsic disposition of invulnerability. In short, all similar counterexamples dealt with W-powers, instead of R-powers.

This conclusion may generate a feeling of frustration in the opponents of IP: "well, then *how* are we supposed to argue for extrinsic dispositions, exactly?". This question generalizes as a question for all power realists –both an epistemological question, and a question of method: how do we find out which dispositional words (and thus, which W-powers) correspond to genuine R-powers, and therefore, how do we find out which powers there are? Answering these questions is a prerequisite, if one seeks to find out whether there are extrinsic powers.

Unfortunately, I suspect that finding out which portions of dispositional language genuinely carve out dispositional parts of reality, is, to some extent *a posteriori* matter. It is *a posteriori* matter which dispositional words express genuine dispositions, and therefore the previous questions may not be fully answerable from the *a priori* armchair of the metaphysician. Thus, the question of whether there are extrinsic powers may not be one that this work may set out to answer –or any work in metaphysics, for that matter. The opponents of IP may, at this point, turn the table on us and ask: "what, then, makes you think that powers are intrinsic? If it is really so hard to find out which powers there are, how can you assume that the ones that exist are intrinsic, rather than extrinsic?". Most, if not all, of the paradigmatic cases of dispositions that power realists *take to exist* appear to be intrinsic –but that is hardly the kind of ground one would want for IP to rest upon.

To this question, I would like to reply that the methodology of the power realist who supports IP has been severely misinterpreted. As far as I can tell, power realists do not defend IP by way of examples; viz., they do not claim that, e.g., powers p_1, p_2, and p_3 exist, and that they are intrinsic. Most of them are well aware that it is very hard to find out which powers exist, even under the assumption that there are powers. That job would be even harder than that, considering that it would require the power realist to properly individuate *all* the powers that exist, and not just some (given that IP universally claims that "all powers are intrinsic"). Rather, when powers realists defend the claim that powers are intrinsic, they claim that whichever powers happen to exist, are intrinsic. This is, in my opinion, a very robust assumption that the foe of IP might want to question; it might make for a better offensive than the gerrymandered collection of counterexamples discussed above. But, as far as I know, this has not been discussed.

5. About interferences

That powers are, in Lewis' words, an intrinsic matter, has always been considered an additional difficulty in solving the problem of interferences, viz., phenomena such as finks, masks, antidotes,

mimicks, and so forth.[64] This thesis is not interested in the discussion about the conditional analysis of dispositions, nor, more generally, in the discussion about conditional entailment, yet the previous considerations about powers and their manifestations suggest interesting conclusions on the nature of interferences. More specifically, what they suggest is that, metaphysically speaking, there is really no "problem" of interferences. Or so I would like to argue.

As we have seen, the manifestation of the power (whatever we choose between the multi-track or three-step model) does not depend on the circumstances, and is not extrinsic in any sense of the word. What the power is for…, its possible manifestations, is somehow encoded or embedded in its nature, and is not matter of fluctuation. However, what depends on the circumstance and is therefore, an extrinsic matter, is *that* the power manifests. Similarly, how the power manifests is extrinsic and highly circumstantial matter, for, as we have seen, which specific outcome a power produces (causally) depends on the circumstances –and what exists and the properties it has. It is therefore not absurd to think that, a lonely object in the universe is set and ready to interact with anything that there can possibly be. It just happens that it does not.

Thus, an object's powers encode all possible manners of causal interaction. What about interferences, specifically? Interferences do not work through magic –they causally interact with the rest of the system they are interfering with. Since interferences are presumably part of the causal environment a power finds itself in (perhaps they are power partners as well), an intrinsic power is ready and set to produce the right manifestations in all circumstances, even those involving interferences. Thus the problem of interferences is only a subjective problem –a problem for *us*, who expected a different result from the one we actually got: for in an interfered scenario, the power is not producing the manifestation that we have used to to identify and describe it through. But the power can do so much more than that (remember the aforementioned quoted passage by Williams). This holds whether we choose the multi-track or three-step model. For instance, assuming the three-step model, we might think of the expected/interfered result is a non-resultant, partial effect, obscured by the presence of another contributor. The law that predicts the actual result is another, more general one –what we did not consider the first time around. If one fails to obtain an expected result, one might legitimately require an explanation in terms of a more general law capable of providing the right prediction, one that involves the interfering factor as well.

In this sense, interferences are not a metaphysically prominent phenomenon, and can be "carved out" from other causal factors only in virtue of our mental attitude towards them –viz., their being *unexpected*. This is reason enough, for a metaphysical realist, to ignore them as subject matter of investigation in their own right. This is not to claim, mind you, that interferences do not really pose any problem to the link between dispositions and conditionals –they do. And neither this observations suggests a straightforward way to solve it. Nor it suggests that a solution exists. It however suggests that the problem, albeit real, is not an extremely deep problem of metaphysics. [65]

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[64] Lewis (1997), but also see Choi (2003, 2009).

[65] For similar considerations, Heil (2012: 126-130). What about interferences like wizards and angels, that occasionally seem to indeed be working through magic? Assuming those cases to be genuine, one could conclude that some interferences are indeed metaphysically prominent, in the sense that they show how some causal processes can be disrupted by supernatural intervention. This supernatural intervention is such that no law of nature describes, or prescribes, its behavior, and no empowered object is "ready and set", as it is, to behave accordingly. But the interaction takes place anyway. I am not sure whether these cases present additional difficulties for supporters of the link between dispositions and conditionals. At any rate, they would appear to be an incredibly onerous assumption, if they were just to be posited for that end.

CHAPTER SIX
RELATION(S) BETWEEN POWERS AND THEIR MANIFESTATIONS

1. Introduction

In this Chapter I discuss the plausibility of taking at face value the idea that powers are directed to their manifestations –viz., that there is a genuine relation between a power and its manifestation. I will call such a position "relationalism about dispositional directionality", or more simply, "relationalism"; its negation will be called "non-relationalism". Relationalism about dispositional directionality is, as claimed in previous Chapters, a contender for the role of mark of dispositionality.

This is the plan of this Chapter. By using the criteria of relatedness set up in Chapter 2, I will try to make a direct case for relationalism –to argue directly for the presence of a directionality relation between a power and its manifestation. Although relational talk is quite common amongst some friends of powers, however, my conclusion will be that this approach is quite wanting. There is no straightforward way to directly argue for relationalism. So perhaps an indirect case, one that criticizes the opponent, will be preferable: thus I will discuss the non-relational alternative and its plausibility; relatedly, I will argue that the main argument in its defence, the so-called "Meinongian Argument", is in fact highly inconclusive. Thus, there is no conclusive argument for nor against relationalism. Having defused the non-relationalist argument and discussed the problematic of the non-relationalist position, I will proceed to develop my own (relationalist) account. In passing, this will be an opportunity to explore the exact nature of powers and manifestations, which metaphysical category they fall into. Finally, I argue that my relationalist account suffers from a problem, called the "Harmony Problem". However this Harmony Problem is but an instance of the Governing Challenge that all versions of power realism have to face (see Chapter 1); and my account is in fact better off than the non-relationalist alternative when it comes to rising to this challenge.

The conclusion will be that, even if is difficult for power realists to argue directly that there is a genuine relational bridge between a power and its manifestation, it is still a perfectly tenable position: the arguments against it don't go through, and the alternatives suffer from problems on their own. However, whether that warrants taking dispositional directionality as the genuine mark of the dispositional, remains to be seen.

2. A bridge between a power and its manifestation

Some friends of powers claim that a power is somehow "directed to" a manifestation event, or that it "points towards it", but it is often difficult to bring these expressions outside of the realm of the spatial metaphor. Sometimes the terms "directedness" (Mumford 1998, Molnar 2003) or "orientation" (Tugby 2013) are used; Charles Martin, in (Martin 1997, Martin 2008) uses the expressions "readiness" and "selectedness" with a somewhat similar meaning. In this thesis, I use the somewhat artificial term "dispositional directionality" or simply "directionality" to refer to this alleged feature of powers.

The expression "manifestation" is, on the fact of it, epistemologically loaded: it refers to the behavior of an empowered object as it discloses before our eyes. For instance, a shattering going-on (to use a neutral term) is how a glass bottle manifests its fragility, in the sense that it constitutes the only, indirect, epistemological access we have to that power: this is ultimately why we conceptualize and list

powers as what they are powers for.[66] But this does not need to be so; powers found in some inaccessible interstice of nature might have equally inaccessible manifestations, which can only pick up by the most advanced instruments at our disposal. For the power realist, however, this epistemological privilege does not translate into any discernible metaphysical privilege –in the sense that manifestations are not to be contrasted with powers as "categorical" or "occurrent" entities –less ethereal and more real than the powers that they are manifestations of. If there is a dispositional/categorical divide, there is no reason that it carves the distinction between powers and manifestations.

Thus it will be that, in a way, each power is paired with its own manifestation; yet this mysterious link needs to be dispelled and understood. Unfortunately, it is not something that can be easily dispelled: as it is not something that is merely conjured up by taking the language too seriously or by putting, as they say, the conceptual cart before the metaphysical horse. For its supporters, directionality to a manifestation is built into the nature of powers themselves, and is what fixes their identity; each power is therefore essentially a power for its manifestation. As in Molnar (2003: 60):

> "Directedness is an essential feature of power properties […]. Having a direction to a particular manifestation is constitutive of the power property."

This metaphysically robust understanding of dispositional directionality is the one that is usually taken by some power realists to be, as we will see, the genuine mark of the dispositional, the special ingredient that makes a property a power.[67] In short, dispositional directionality lies at the very heart of powers. It is therefore a phenomenon worth exploring.

A last *proviso* is needed before starting. It is customary to engage the debate about dispositional directionality as the debate revolving around this two-place relational bridge between a power and its manifestation. But as we have seen in the previous Chapter –when I presented the three-steps and the multi-track model–, this is somewhat of a simplification. Either each power is associated with more than one manifestation, and maybe more than one <input, output> stimulus/manifestation pair as well (multi-track model); or perhaps the power is associated with a single manifestation, in the sense of a partial contribution to an effect (three-steps model). This of course is bound to complicate things – especially since this Chapter is set to discuss the metaphysical nature of manifestations.

Here is what I will do. In what follows, I will not take manifestations to be contributions in the sense offered by Molnar (2003), viz., according to the three-steps model. For, as of now, there's too many questions that this model leaves unanswered. What kind of entity are contributions? How do they "compose" resultant effects? The simplest example of two horses pulling a cart (as in Molnar 2003:

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[66] This is not to say that the presence of the manifestation is an infallible tool for the detection of a power. Sometimes, as I will discuss later on, there can be powers that do not manifest, and therefore would seem to be inaccessible to us. And contrariwise, cases of mimicking show that sometimes the manifestation of a power can be simulated even if the power is not there, as when a charge of TNT is used to break a stone pillar in the way a fragile object would break. Thus, I am not saying that the inference from the manifestation to the power is exceptionless. Furthermore, it might not be the only way to infer the existence of a power. For instance, we might know what the base of a kind of power is, e.g., the crystalline microstructure of a fragile glass, and infer that everything that has that structure is also fragile. I will not say more on this topic; it just goes to show that to claim that the only epistemic access to a power is its manifestation needs some qualification.

[67] But in what sense does this directionality to a manifestation "is essential to the power", or "fixes its identity"? I will say more on these matters in the next Chapter, where these positions will be evaluated in the light of the Pure Powers theory that embraces them.

194-196) may suggest that we understand the composition of contributions as a vector addition of component forces into resultant ones. But there are reasons not to do this; for, as in Cartwright (1980, 1983), Wilson (2009) it may be that component forces do not actually exist, and that the correspondent laws should not be understood as expressing shadowy "partial facts" that have yet to be composed to obtain the final result. Furthermore, there's a very simple reason why vectors, their directions and their composition, should not be taken as a way to model powers, their directionality and their compositions. Massin (2009: 572-573, emphasis mine) writes:

> "*the very analogy between vectors' directionality and powers' directedness is misleading*. […] the direction of forces is in fact a complex property that includes their orientation and their sense. […] Concerning orientation, we've seen that it requires a spatial relation between the body that exerts the force and some point outside it. Now, it is true that with the directedness we have two entities: the disposition itself and its possible manifestation. But these two entities clearly do not stand in a spatial relation to each other. First, when the manifestation is not actual, there is presumably not any genuine relation at all, since one of the terms of the putative relation does not exist. Second, even when the manifestation occurs, it makes no sense to ask about the distance between the breaking of the glass and its fragility."

Consider the case of the two horses pulling a cart. One horse pulls straight in front of him, but the resultant movement is in another direction, according to vector addition. What is the power of the horse? The component force? If so, its directionality towards its manifestation cannot be the direction of the vector, since the manifestation/contribution of the power is most clearly not a spatial point in front of the horse. Or perhaps the component force is the contribution itself; but in that case, again, it's unclear in what sense the contribution is spatially directed back to the power itself. Perhaps this suggestion, which has been notably explored in Mumford and Anjum (2011) is not to be taken literally; perhaps one could simply say that powers and their contributions compose *just like* vectors do –even if they are not literally the same thing: e.g., it may be argued that power's contributions compose, in a quality space, just like vectors do, in a physical space. Yet, given that many powers require complicated non-additive rules of composition –as Mumford and Anjum (2011) steadily claim– it is unclear how this analogy is supposed to make things clearer (also Bird 2016).

In conclusion, it is unclear kind of entity a contribution really is, and it is equally unclear how multiple contributions are supposed to compose a resultant effect. We shouldn't try to account for the latter in terms of mereological composition, at least, not in a standard understanding of the term (as hinted in McKitrick 2009: 81-82). For one, if the same power contributes to two qualitatively opposite results A and B (e.g., in the case of a specific power of a chemical substance, an animal getting healthier and a different animal getting sick), does this mean that the two results mereologically overlap? This doesn't seem plausible. Mereological overlap is standardly taken to imply spatiotemporal overlap; and it is beyond false to claim that two animals reacting to the same substance must, for that same reason, partially occupy the same region of space. A contribution –in Molnar's sense– cannot be part of the resultant effect for the simple reason that it is a different kind of entity entirely; it belongs to a different metaphysical category than a resultant effect. Requiring contributions to mereologically compose resultant effects, such as events or processes, would be as absurd as requiring concrete entities to mereologically compose abstract ones. The composition of contributions is a different beast entirely.

All in all, the three-steps models deals in mysteries. It may have its virtues, at least in an instrumental and heuristic sense; for it may help one clearly recognize a power's steady contribution in all of the causal processes in which it is involved, and, similarly, it may help one visualize how all such contributions add up to a final result. But the upshot of the previous passages is that we shouldn't take

it too seriously –we shouldn't reify it. As claimed by Cartwright (1983: 59), *we* add forces and contributions, and *we* make calculations. But nature, probably, doesn't.

On the contrary, there's a perfectly understood sense of "manifestation" as an occurrence, a going-on, maybe an event or a process, and this is the kind of manifestation that I am going to discuss (see McKitrick 2009 for a similar defence of manifestations-as-effects). Does that mean that I embrace the multi-track model? Perhaps. Keep in mind, however, that I haven't argued that the three-steps model and the multi-track models exhaust all options. Were I to embrace the multi-track model, it would mean that each manifestation only *partially* individuates a disposition, since there is a multiplicity of manifestations (or <stimulus, manifestation> pairs) associated to each disposition. I will ignore this complication, since it is of no particular importance. Summarizing, for reasons of simplicity, I will stick to the initial idea that there is a two-place directionality relation between powers and manifestations (as observable outcomes, causal effects, etc etc...); so we will have the power to break, the power to dissolve in water, and so forth. Every instance of that relation, however, is only a part of the story of how the power gets its identity –more instances, to more manifestations-as-effects, are needed for each power.

3. Relationalism about directionality

It is somewhat common to think that powers involve some kind of relational aspect of the world. Sometimes the association with causal relations is made, while some other times the reasoning is more subtle. Langton (1998) submits that a relational understanding of powers depends on the association (started with David Hume) between causal powers and forces. It is however highly controversial whether Newtonian forces are relations, or whether forces should be equated with powers, rather with their manifestations, or neither. And later on in this Chapter, we will see how directionality is in fact not a causal relation.

Prima facie, however, there's a natural reading of dispositional directionality according to which there is a relation involved. As introduced in Chapter 2, a relation does not merely qualifies one or more entities, but provides some kind of "bridge" or "arc" that connects them. Something like this appears to be happening between powers and their manifestations; put the powers on the one side and the manifestations on the other (never mind the fact that many manifestations might in turn be, or involve, powers), and you still need to pair each power to its manifestation: this is why I believe that Charles Martin's term for dispositionality, "selectedness", was spot-on. Directionality is what pairs each power to its manifestation; for each power, it selects its specific manifestation. Thus, this identity-fixing feature of powers seems to be a relation. Another symptom that we might be facing a relation is the following, first proposed by Barker (2009). The very notion of directionality suggests an order and an asymmetry that cannot be accounted for without a relation; after all, if power P is directed to manifestation M, one of them is the power, and the other is the manifestation; such roles can only be assigned with the help of some kind of relatedness.

However, the tests for relatedness advocated for in Chapter 2 fail to provide conclusive results either way. First of all, remember Russel (1903) semantic test, according to which whenever a predicate involves a referential term (or, better still, an expression in a referential position) to something numerically different from its bearer, then we have between our hands a relational predication and a relational properties –and therefore, probably also an underpinning relation. This clearly gives the right result in sentences such as David is the father of Solomon, as it successfully narrows down to a relational predicate "is the father of Solomon" (Salomon is something different from David).

What about dispositional predicates, such "as disposed to break", or, "the power to break"? To be sure, "breaking" is not a name in the same clear way in which "Solomon" is name. But it may be –or, more precisely, it may appear in a referential position. In the sentence "the breaking was quick" the expression is in a referential position: grammatically, it is the subject. It presumably is the name of some event or process which is said to be quick. There is no straightforward argument to the conclusion that "breaking" behaves semantically in the same way in "the breaking was quick" and in "this glass has a power for breaking". And furthermore, note that other dispositional expressions behave differently. We may say "this glass has a disposition to break", which makes things difficult. As "break" is a verb rather than a noun, it is more difficult to argue that, semantically, it is in a referential position. Thus the idea that dispositionality is a relation is not completely vindicated using this criterion.

Please note, however, that it is certainly easier to argue that if "breaking" refers to something, it refers to something numerically different from the power of breaking. A breaking process involving a glass is not the same thing as the fragility that the glass has; amongst other things, because the fragility explains the breaking. Alternatively (see later on in this Chapter) we might take "breaking" to stand for the property of breaking. Then a similar argument runs as follows: by simply noting that *fragility* and *breaking* are two different properties.[68]

In the previous Chapter, I have explored the claim that powers are intrinsic in a way that at least involves some degree of modal independence from the existence of any contingent object distinct from the bearer. An object may have a power, I concluded, to interact with any manner of objects that do not actually exist. Objects in isolation, or, to use Lewis and Langton (1998)'s expression, lonely objects, are indeed equipped with powers. But if that is the case, the same reasons which led us to think that powers are intrinsic, now suggest that they might be non-relational. In fact, powers do not presuppose the existence of anything else in the world. This was the conclusion reached in Martin (2008: 6), as he claims:

> "dispositions are not relations. A disposition can exist although its manifestation, or even its reciprocal disposition partners, do not."

Note, however, that the potential loneliness of powers proves that powers –rather than directionality– are not relations. However, this is not what is at stakes here. It is agreed by almost everyone in the debate that powers themselves are not relations; the point is whether dispositional directionality is a relation. In order to check whether there is a genuine relation of dispositional directionality, one has to ask: does there need to be any y distinct from power x (such that x and y are related by dispositional directionality), in order for x to be a power to…? Does a power require the existence of anything distinct from it in order to exist, and be a power for…? This is admittedly not an easy question to answer, also because we still do not exactly know in what category "manifestations" fall into.

Here is a consideration in favor of relationalists and against non-relationalists. Consider a world where there is no such thing as breaking; a qualitatively impoverished world where the type *breaking* does not exist (perhaps it is sufficient to say that nothing has ever broken, or will ever be broken; perhaps not). Can something still be fragile, viz., with a disposition to break? The non-relationalist lacks a reason for denying it; according to her, we might conceptualize a power as a power to break, but we should not sweat too much thinking about the reference to breaking in that description. Now, a metaphysics with a weird "Leibnizian" flavor ensues, where powers are non-relational and self-contained entities, yet they

[68] More generally, for the claim that powers and their manifestations are or involve different properties, see Bird (2007a: 140) and Mumford and Anjum (2011: 5). For an almost unique alternative, see Marmodoro (2017).

have a nature that, when described, contains reference to a vast numbers of processes, events, states, or perhaps properties, whether or not such things actually take place or even exist. But now consider a qualitatively enriched world, that is not ours. This previous consideration suggests that there might be, in this very world, something with a power to sch-break (an alien quality type), even if there is no such thing as sch-breaking (nor the relevant powers partners needed for something to sch-break) in his world. That is to say, it might be the case that actual powers encode information (epistemically inaccessible information) about the natural laws of a qualitatively richer world. And this is of course very mysterious.

This conclusion is of course quite controversial, and possibly problematically. But cannot, on its own, offer a *reductio* of the non-relationalist position. Firstly, because the non-relationalist can simply bite the bullet and accept that actual objects are ready and set to behave in ways that cannot actually occur. Secondly, because in the light of the C&H$_3$ criterion for relatedness put forward in Chapter 2, even if it is true that a power to break cannot exist without the existence of the type *breaking* also existing, it still wouldn't follow that the two are related; for, according to C&H$_3$, there also needs to be instance of dispositional directionality between the two. However, the existence of such an instance is exactly what is at stake here.

On the contrary, the C&H$_3$ criterion of relatedness may support a non-relationalist conclusion. In fact the criterion, when applied to dispositional directionality *qua* relation, dictates that whenever directionality has an instance, the manifestation of the power also exists, as in condition (ii). This brings to the forefront the point of contention of this Chapter, viz., the Meinongian Argument against a relational account of directionality. Loosely speaking, it's the idea that because powers can go unmanifested, there cannot really be a genuine relation between a power and its manifestation -since all *relata* of a relation must exist. As I will explain, I take this argument to be based on a confusion on which relations we are talking about.

Many have found the Meinongian Argument quite convincing. Relatedly, the problematic status of the manifestations of unmanifested powers has spun the debate in wildly different directions. For one, it has been suggested multiple times that *directionality* and *intentionality* have something in common, starting from the possible inexistence of the object that is "pointed to" (the manifestation). Martin and Pfeifer (1986) explained how many crucial features directionality and intentionality share, and this has led many philosophers to take the parallel very seriously. Molnar (2003), Place (1996) and the contribution of the same author in Armstrong, Martin and Place (1996), conceived directionality as a kind of physical intentionality, if not intentionality *tout court*. Thus directionality would not be a genuine relation, in the same way in which intentionality is not a genuine relation. That being said, however, there are many reasons to doubt that intentionality, a very mysterious phenomenon of the mental, holds any degree of explanatory value when it comes to directionality; one could perhaps think that the explanation goes the other way round.[69] Incidentally, Mumford has noticed that to draw the conclusion that dispositionality and intentionality are one and the same (a conclusion which, considering intentionality as the mark of the mental, threatens to turn into panpsychism) is exactly what Martin and Pfeifer, in their paper, did not want to do: their point was exactly that the current characterization of intentionality was not sufficient to make it an adequate criterion to distinguish the mental from the physical (Mumford 1999: 220-221).

Finally, a more skeptic non-relationalist conclusion could be the following: the appearance of relatedness, suggested by our linguistic and conceptual habits surrounding powers, needs to be dispelled

[69] As in Armstrong (1997: 79), Bird (2007a: 114-115) and Borghini (2009).

rather than reconstructed philosophically. Perhaps we have been led astray by the parallel with intentionality: in thinking of empowered objects as full of threats and promises (to borrow the famous expression from Goodman (1954: 40)), we may have been exaggeratedly anthropomorphizing them (Armstrong, Martin and Place 1996: 93). Perhaps it was just a useful conceptual tool, as in Borghini (2009); or, finally, it could have been the nefarious influence of empiricist epistemology in our understanding of properties merely in terms of their causal effects that we can witness (Ingthorsson 2013).[70] In general, one can deny that powers "point towards" their manifestations in any significant sense, and that we would be way off tracks in thinking that there is a relation between power and manifestation. Dispositional directionality cannot be completely eliminated from the inventory, since, in a way or another, each power must have its own manifestation: somehow, this selection must take place. Yet a number of philosophers have preferred to account for this in a primitivist fashion, rather than analyzing it through a relation. It is sometimes stated that it is just a brute fact that that power has that manifestation rather than another; or, alternatively, that it is just in the nature of that power x, that an object empowered with x will be involved in the y behavior, and no further analysis is given of how and why y is the manifestation of x. For instance, Heil (2003: 123-124) writes, after endorsing the Meinongian Argument:

> "[...] you would not want 'connections' among powers to reside outside those powers. It does not follow, however, that the connections reside inside the properties. The truth-maker for the claim that Fs together with Gs would yield manifestation M is not something in addition to F and G, not even some detachable component of F and G, but just F and G: it is 'of the nature' of F and G to yield manifestation M. This is what it means to say that properties are powers."

Of course, as Lewis (1983: 352) claims, "not every account is an analysis"; however, if an equivalently adequate account was available, one with more information about directionality and dispositionality, it should be preferred. At any rate, no argument has been in provided in this section that should lead us to prefer a relationalist account of dispositional directionality over a non-relationalist account; and neither vice versa.

In the next section I will argue against the Meinongian Argument against relationalism, ideally levelling the playing field between the two options.

4. The Meinongian Argument

4.1 The Argument

We have seen in the last Chapter that powers are intrinsic, and they can be instantiated whether or not the circumstances bring them to be activated; we have also seen that powers are not ontologically inferior to their manifestations –they do not need a manifestation event to be real, or actual. These philosophical points suggest (something that non-philosophers already knew) that an empowered object need not manifest its powers at all times; and perhaps not even at any time; sometimes a disposition is acquired and then lost without ever manifesting, as the fragility of a glass bottle that is produced and then melted without ever breaking. Incidentally, this makes it quite difficult, sometimes, to establish whether an object ever had a specific power or not. In the more extreme cases, if it is indeed true that our only indirect epistemic access to powers come from their manifestations, we would

[70] Also see Langton (1998) for the claim that the relatedness of powers is merely conceptual in nature; for her powers are not, in themselves, relational.

say that the relevant dispositional ascription is verification-transcendent (although, as I suggested, it might not be absolutely undecidable). In the words of Lipton (1999: 163):

> "The binary distinction for occurrent properties -either an object has the property or it does not- is for dispositions replaced by a tripartite distinction: displaying, present-but-not-displaying, or absent."

Those powers that are "present-but-not-displaying" are not involved in any kind of causal activity to the end that their manifestation is produced. Employing the term introduced in McKitrick (2013), I call such powers *latent powers* (more precisely, I call latent powers those powers that are not just currently not manifesting, but those that will never manifest, as long as they are present). Latent powers are not less real nor actual than the others. Additionally, they are still "ready to go" (to use another of Martin's figures of speech) whenever the circumstances are right for their activation.
That there are latent powers is a crucial premise for the Meinongian Argument. In order to understand the Argument, consider the following dilemma.

1. There are latent powers
2. There is a directionality relation between each power and its manifestation
3. If a power is latent, there is no (actual) manifestation of that power
4. There are all *relata* of all relation instances
5. There are no merely possible entities

Both (1)-(4) and (1)-(5) form inconsistent sets of statements. (1), (2), and (3) together settle that there are directionality instances with missing *relata*, in the case of latent powers. Yet this is not possible, according to (4). Perhaps then, one might think that to fill in the steps of the manifestation in such instances of directionality could be not actual, but merely possible occurrences. This is denied by (5).
Let me discuss the five claims and their plausibility, starting from the bottom. For someone not very familiar with the debate about dispositions, (5) must look like an extremely controversial claim, one that should not be simply endorsed without an argument. And while, in fact, sometimes it is simply assumed without further discussion (the use of the expression "Meinongian" as a derogatory term is telling), there is a reason behind it, as submitted in Tugby (2013). Powers are admitted in the ontology on the basis of the work that they can do in the account of causation, conditionals, laws of nature and modality. The acceptance of mere *possibilia* in the ontology, of any kind, would undermine those, especially the account of modality; in fact, power theorists often classify themselves as actualists, wanting to account for all possibilities and necessities in purely "naturalistic" terms, without *possibilia* or possible worlds of any kind, neither abstract or spatio-temporally disconnected. For this actualist qualification, see Eagle (2009), Contessa (2010), and Vetter (2011). As far as I know, the only relationalist about directionality who is willing to give up (5) is Bird (2006), which accepts the claim that (the being of) a power involves unrealized possibilities to which the power realist is ontologically committed to. However, Bird tries to neutralize this claim by reconstructing *possibilia* along the lines of the contingently non-concrete entities as in Linsky and Zalta (1994) and Williamson (1998).
Claim (4) superficially seems uncontroversial, but may need further elucidation. For what exactly does it mean to say that there are "all *relata* of all relation instances"? Simple elucidations such as "if an *n*-adic relation has an instance, there are *n* things related by it" are false, because, having defined *arity* in Chapter 2 as the maximal number of objects that can be involved in an instance of the relation, a relation does not always relate the maximal number of objects it could relate. Perhaps (4) is more easily

formulated within a *positionalist* framework about relations, where we explicitly talk of places or positions. Then it simply amounts to the claim that there never are "empty places", viz., places with no objects assigned to them. But I am confident that a more precise formulation of this philosophically intuitive claim can be provided. At any rate, this is not the time to search for it.

Claim (3) seems *prima facie* true. If a fragile glass is disposed to break, it seems that, as long as that glass is treated with care, its breaking is a merely possible occurrence, or does not exist. There is no such thing as its breaking (this terminology might be confusing if we believe that the breaking is something that *obtains* (like a state of affairs), or *takes place* (like an event, or a process), rather than *exists*.

Claim (2) is the one under scrutiny. It is important to note, in passing, that directionality is a phenomenon holding for all powers, latent or not. Directionality is, as we have seen, a crucial feature of powers, and perhaps a way to tell apart powers from non-powers; it would be a confusing ontology one that treats latent powers and manifesting powers in fundamentally different terms. Our account of dispositionality should therefore be homogeneous; I will not discuss the plausibility of a view according to which some powers, but not all, are directed to their manifestations.

Claim (1), that there are latent powers, is a background assumption that I already motivated. Sometimes it is taken for granted, but it can be (and it has been) rejected: I will discuss it later on in this Chapter.

Roughly speaking, the Meinongian Argument consists in the claim that in the (1)-(5) inconsistent set, it is (2) that must go. It is an argument from premises (1), (3), (4), and (5) to the conclusion that not-(2).We should rather have a non-relationalist attitude, towards the notion that a power somehow selects and its paired to its manifestation. The hidden line of reasoning is that (2) has less credibility than all of the other claims, and that therefore should be rejected. Of course, this reading is not mandatory. For one, the Meinongian Argument was first formulated by David Armstrong in *A World of State of Affairs* as an argument against powers *tout court*, an argument based on the idea that power ontology should be dismissed as it legitimizes the merely possible and the non-existent. This reading of the argument had its fair share of supporters, but it is really hard to see its strength. It would be justified only if (2) was an inescapable assumption in any power ontology: an evidently false claim, since many power theorists do happily without it. To be clear, perhaps Armstrong (1997: 79) has something more complicated in mind, when he claims that "the object has within itself, essentially, a reference to the manifestation that did not occur". The presence of a referential term for something numerically distinct from the bearer is sometimes taken to be a criterion of relatedness. So perhaps Armstrong was a supporter of (2), and would have tackled the dilemma by denying (1): there are no powers, latent or otherwise.

The standard Meinongian Argument against relational accounts of directionality, has its supporters. For instance, Martin (2008: 6):

> "The readiness of something's disposition for all of this may fully exist although its disposition partners and mutual manifestations do not. As such, dispositions are not relations. A disposition can exist although its manifestation, or even its reciprocal disposition partners, do not. Salt in a world lacking H_2O would have many of its readinesses unfulfilled."

And similarly, Borghini and Williams (2008: 34-35):

> "Thinking of unmanifested dispositions as relations to some mysterious non-existent manifestation might be one way of characterizing dispositions, but it is not one we endorse (nor does anyone else as best as we can tell). For this reason, we are not burdened with Meinongian entities. We likewise avoid characterizations of dispositions as directed at their manifestations, for similar reasons. Both relations and directedness imply that the manifestation must exist somewhere (as the object 'pointed to' or as the

missing relata), where that somewhere cannot be actual or natural. We recognize all too well how undesirable this is."

Of course, once again, this leaves it open what the nature of dispositionality will be. The authors continue (*ibid.*):

"What we are really faced with is not a matter of Meinongianism, but what the nature of dispositionality is. We have reached a rock-bottom problem. Somehow, however it may be, dispositions produce manifestations when met with appropriate stimulus: we take the nature of dispositionality to be a brute fact."

My strategy is the following. I argue that the Argument is inconclusive on its own rights, since there is an ambiguity in the word "manifestation" that specifically affects claim (3). In one interpretation (3) is true, but the argument does not go through. In the other, (3) is simply false. The Argument against relatedness is undermined. In a later section I will also argue against (1) (the existence of latent powers); but the reasoning behind the rejection of (1) clashes, as we will see, with the reasoning behind my disambiguation of (3), so I prefer to keep (1) and work on (3). First of all, however, I would like to present a generalization of the Meinongian Argument.

4.2 A generalized argument

My presentation of the Meinongian Argument dealt with non-existent or merely possible manifestations (as events) –and the non-desirability thereof. But the Meinongian Argument can, and occasionally has been, framed in slightly different terms. This oscillation is due, once again, on the fact that it is not uncontroversial what kind of thing a manifestation is, either an event, or a state-of-affairs, or a process. Here I would like to offer a generalized version of the Argument. Consider the following five premises.

1* There are latent powers
2* The manifestation of a power is a *circumstance according to which p* (for some p)
3* There is a directionality relation between each power and its manifestation
4* If a power is latent, "p" is false
5* There are all *relata* of relation instance

Premises (1*), (3*), and (5*) are like before. (2*) and (4*) are new, and revolve around the notion of circumstance –that I now pass to introduce. "Circumstance" is a term of art, an umbrella-term that I will use to refer events, state-of-affairs and facts alike. What warrants the association of event, state-of-affairs and facts under the label "circumstance?" There are a great amount of positions about states, events, facts and their relations; and usually it is not easy to pinpoint specific metaphysical commitments in the literature about dispositions, whether manifestations are states, facts, events… –it surely does not help that many philosophers engage with dispositions and their manifestations while at the same time playing fast and loose with the metaphysics. But it seems to me that all similar positions have something in common, and fall under a more general category. To see this, consider that facts, events, and states can all equally be expressed through either propositional constants or sentences, with the help of that-clauses. Both state-of-affairs and facts can be easily introduced through that-clauses; and although usually states and events can be named

through imperfect and perfect nominalization from sentences, it isn't far-fetched to use sentences, or perhaps propositional constants, to refer, or at least describe, such things as well. Roughly put, sentences state that something is taking place in the world –they are describing some situation, happening or going-on that contributes to reality. I will use "circumstance" as an umbrella term for all such items –which I hope is as general and theory-neutral as possible. Circumstances are regulated by the following principle:

> **C_1)** If it is true that *p*, then the circumstance according to which *p*, satisfies condition C (and vice versa)

What condition C is, depends on your philosophical sensibilities: perhaps the condition is simply that the circumstance *exists* (like a fact), that it *obtains* or *takes place* (like a state), or that it *occurs* (like an event); thus it might or might not be the case that condition C partitions the set of circumstances.

Now, the manifestations *qua* circumstances of latent powers do not satisfy condition C. In fact, consider a Socrates' disposition to play music, whose manifestation is the circumstance according to which Socrates is playing music. If the power is latent, it is false that Socrates is playing music (4*), thus, according to C_1, the circumstance that is the manifestation of Socrates' latent power does not satisfy condition C. What's wrong with that?

As I said before, C_1 does not state whether condition C partitions the set of circumstances; but if (1*)-(5*) hold –it does, because, for some p, there are circumstances according to which p even though "p" is false. In short, condition C partitions the set of circumstances in two subsets, one for circumstances according to which p such that "p" is true, and the other where "p" is false. You can give many names to the two partitions, depending on your philosophical sensibilities: the set of obtaining circumstances versus the set of non-obtaining circumstances, those that exist versus those that do not exist, or that "merely subsist", or maybe those that are actual versus those that are merely possible. The names do not matter –what matters is that, from an ontological point of view, the power realist who accepts (1*)-(5*) now has both partitions of the set of circumstance at her disposal –and the condition C imposing the partition itself. This is all you need for an ontology of modality –a job that was supposedly to be achieved by powers, and *not* their manifestations. That is to say, for each *p* such that "◊p" the power realist now has at her disposal some ontological ground in the form of a circumstance according to which *p*; because of the partition through C, not all such circumstances are metaphysically alike; this in turn grounds the difference between cases in which "p" is true and those in which "p" is false –viz., the difference between actuality and mere possibility. The only one to explicitly recognize this danger is, as far as I am aware of, Tugby (2013: 458-459), who submits that:

> "[a]ccepting the existence of states of affairs corresponding to each and every unrealized possibility for the purposes of accounting for dispositional directedness would clearly inflate our ontology significantly and so should be avoided if at all possible, in the interest of economy. […] Pushing aside typical worries concerning the metaphysical oddness of unrealized entities, the main problem is that this strategy threatens to undermine the main motivations for accepting irreducible dispositions in the first place. The worry here concerns the fact that the main motivation for accepting irreducibly dispositional properties is that they can provide truthmakers for a variety of modal claims such as those concerning counterfactuals, laws and dispositions themselves."

Thus, the (1*)-(5*) inflates the power realist's ontology in a way that undermines the admission of powers in the ontology. An adversary of relational directionality would take it as reason enough to abandon (2*) –although, as far as I am aware of, this generalized version of the argument has never been considered by anyone, friend or foe of relationalism as it may be.

4.3 Two relations

Both versions of the Argument can be undermined by closely examining (3) and (2*)–(3*). Curiously, my reasoning such premises starts from the same assumption used to formulate the Argument, claim (1): that there are latent powers. It goes to show that there are two relations at play here, instead of one; this generates an ambiguity in the expression "manifestation", which nullifies the value of (3) and (2*)–(3*) in both versions of the Argument.

The (alleged) relation of dispositional directionality is an identity-fixing relation, which is what makes a power a power *for*... We are still not sure what the *relata* of this relation ultimately will be. Let us call this relation "D", or the "D-relation". But there is another relation which is often discussed relatively to powers; a relation of causal production, or, more generally, a causal relation between powers and their manifestations. Paradigmatically, Mumford and Anjum (2011) claim that powers causally produce their manifestations. These entities are causal going-ons that occur in the physical world; they are the manifestations that I earlier selected, as opposed to the "contributions" of Molnar's (2003) three-step model, and that I labeled "circumstances" . Furthermore, they have been taken by various philosophers to belong in the most disparate categories of metaphysics. For example:

- ...events. As in Armstrong, Martin and Place (1996), Ellis (2001), Molnar (2003), and McKitrick (2010).
- ...states-of-affairs. As in Borghini and Williams (2008).
- ...processes. As in Handfield (2008, 2010), Marmodoro (2017).
- ...changes. As in Mumford and Anjum (2011), Marmodoro (2017).
- ...activities. As in Marmodoro (2017).

These entities are what is missing in the case of latent powers. Let us call the causal relation that brings about such things, "C", or the "C-relation".

There is a commonplace temptation to think of the identify-fixing directionality relation between a power and its manifestation as a *causal* relation; this is an assumption that shapes assumption (3) and (2*) of the Meinongian Argument. But, as I will show in this section, this is a temptation we must resist. Dispositional directionality is not a causal relation –and not just because, as I claimed in Chapter 1, not all powers are causal powers. In short, D and C are not the same relation. Because there are latent powers, these two relations are not co-extensional. A glass may have a disposition to break without actually undergoing any breaking processes (without there being any circumstance according to which the glass breaks). That power is still a power to break, or a power for breaking, it *still* has its determinate identity –thus it is still directed. But it is not actually producing any breaking. Engelhardt (2010: 47) calls D and C two different "aspects" concerning the relation between a power and its manifestation, but I am not sure what she means by that. D and C are not co-extensional. They are two different

relations. There is no single relation (singular) between a power and its manifestation.[71] Moreover, it seems independently plausible that what the supporters of relational directionality are thinking about is not causal in character. For instance Bird (2007b) calls the relation *manifestation relation*, but this relation is essential to every power: so every power necessarily entertains it with something. And it would be simply uncharitable towards him to accuse him to have forgotten latent powers: he must have known there are latent powers; and nowhere he states that such a relation is a relation of causal production, or a causal relation in general.

Now, what about the term "manifestation"? As we have introduced it in this Chapter, it seems to be better applied to the second *relatum* of C: a manifestation is a circumstance, a causal effect, an observable outcome such as a process of breaking. It is what is merely possible, or non-existent, or what have you, in the case of latent powers. But the key line of reasoning now is that because D and C are two distinct relations, there is no reason to think that they have the same *relata*. Thus, latent powers are perhaps still directed to something, but that something need not to be a "manifestation" in the aforementioned sense; thus, there needn't be any *relatum* of dispositionality missing here. Let us call C-manifestation the manifestation in this initial sense (a *relatum* of C); let us also call D-manifestation a relatum of D, that is to say, whatever fixes the identity of a power. Thus, even if latent powers lack C-manifestations, they do not necessarily lack D-manifestations. There is no argument to the conclusion that C- and D-manifestations must be the same items. And the relation that latent powers still entertain is D, not C.

We are finally in a position to see what it is that claims (3) and (2*)-(3*) get wrong. One the one hand, if "manifestation" in (3) is understood as C-manifestation, then (3) is true; however now (1)-(3) do not prove anymore that latent powers entertain relations with missing *relata*; this is because (2) involves the D- and not the C-relation; latent powers miss C-manifestations; but they do not need to be connected to them: latent powers do not produce their C-manifestations, and that's all right. On the other hand, if "manifestation" in (3) involves D-manifestation, then the claim is simply wrong. Or, at least, it gives us no reason to assume that D-manifestations are missing as C-manifestations are (in fact, I will now develop and alternative account of D-manifestations). What is particularly compelling about this counterargument is that the only premise needed to separate D and C, thus D- and C-manifestations, is (1), that is to say, one of the premises of the Argument itself.

And something similar holds in the case of (2*)-(3*): the "manifestation" in (3*) clearly is the D-manifestation, since it is supposed to hold even in the case of latent powers. However, if "manifestation" in (2*) is supposed to mean C-manifestation, then (2*) is most likely true, but does not allow to infer that latent powers are related to, and directed to, circumstances –since (2*) and (3*) mean

[71] Interestingly, because latent powers show that D and C are different, and because D is essentially constitutive of a power, while C is a causal relation, this means that no account of powers can be exclusively causal in character. In fact, the constitutive relation of a power is not a causal relation. I initially agreed with McKitrick (2009: 47) on the following claim: the existence of (groundless) latent powers show that there can be dispositional differences in two worlds with no causal difference to match. Now I believe this to be too strong: in fact, if powers are properties that come to be instantiated somehow, the claim translates into the following: there can be two worlds which differ in which properties are instantiated, but with no difference in their causal history. This is a suspicious claim. However both a weaker and a stronger claim still hold true. The weaker claim: there can be two worlds differing dispositionally with respect to dispositions towards a specific behavior M, without any causal difference with respect to M to match. The stronger clam: two worlds can be dispositionally different, but this difference cannot be metaphysically explained in causal terms (although a causal explanation is still possible).

two different things with "manifestation"; if, on the other hand, (2*) uses "manifestation" to mean D-manifestation, then (2*) is unwarranted, and it can be safely dropped –for there is no reason to assume that powers are directed to circumstances.

4.4 The type-level reply

Now we see that the second *relatum* of directionality need not to be a circumstance such as the ones listed above. In fact, a popular solution consists in saying that it is not: the most common reply to the Meinongian Argument is the so-called *type-level reply*: manifestations are assumed to be not causal going-ons or occurrences (such as events or processes), but rather types of occurrences, repeatable entities of some kind or another.[72] That such entities cannot be C-manifestations, but only D-manifestations, is never explicitly discussed, but it flows naturally from what I have been saying in this Chapter. After all, what is causally produced is not a type, or, as I will argue, a property universal. Furthermore, D-manifestations, intended as types, do not depend for their existence on any of their occurrences, taken individually, and neither do the corresponding powers. Thus the directionality of latent powers is vindicated.

It is now time to address the question: what exactly is a D-manifestation? I think that there is a genuine philosophical pull towards the idea that D-manifestations are property universals. There is no space here to fully set up a debate on properties, especially the opposition between a universalist and particularist conception of properties; but I have been speaking, as usual, about powers as if they were properties. Powers can be instantiated and thus have bearers, and there can be power-types and power-tokens, just like properties.

I will offer the following considerations in favor of a universalist conception of properties as applied to D-manifestations. First of all, take D-manifestations as event-types, as in Ellis (2001), or state-of-affair types. Admittedly, a type of event or a type of state-of affairs look similar to a universal. *Jeff is cooking* and *Jeff is running* do not look like they belong to the same type of state-of-affairs, whereas *Jeff is cooking* and *Martha is cooking*, which, unlike the previous pair, share the property cooking, apparently do. It presumably has something to do with the notion of "type". For one, Armstrong (1997: 28) explicitly characterizes state-of-affairs-types as universals. More generally, property universals can be taken to be types of circumstances.

Secondly, universalism about properties manages to solve the problem without tinkering with very general categories such as "real" or "actual", thus allowing us to keep ourselves on neutral grounds on the relative issues (viz., without tinkering, again, with the (5) claim). On the contrary, e.g., a trope theorist will presumably need to, if she wants to accommodate latent powers and non-occurring C-manifestation. After all, assuming a D-manifestation not to be a property universal, the lack of a C-manifestation for latent powers would inevitably make it difficult to find a D-manifestation as well. Let us call "Bottle" a specific glass bottle; if it has a power to break, and the D-manifestation of that power is the trope *Bottle's breaking*, then a Meinongian-like worry would surface again for D-manifestations whenever Bottle would fail to display her fragility. If Bottle is quietly resting on a cupboard, there is no such thing as *Bottle's breaking* (unless, of course, one wants to claim that there is the trope *Bottle's breaking* even if Bottle is not breaking). This is discussed in Tugby (2013), who also notes that it is no wonder that trope theorists such as Charles Martin, John Heil and George Molnar all reject a relational account of directionality, the biggest source of Meinongian worries.

[72] E.g., Ellis (2001: 132-135), Mumford (2004), Bird (2007a: 104-108), and Handfield (2008).

Finally, independent motivation for this proposal about the nature of D-manifestations comes from Mumford (2004: 194-195). In that circumstance, the author presents an argument to the conclusion that powers are directed not to space-time specific occurrences of their (C-)manifestations, but rather to types, universal-like repeatable entities, which he, likes me, takes to be (universal) properties. A power, even a power-token, is undetermined with respect to the space and time of its manifesting: e.g., this glass' fragility could manifest either by shattering on this region R_1 of the floor, or on that region R_2, or on that region R_3… (in this interval of time Δ_1, or in that other Δ_2, or that other Δ_3, and so forth). A full defense of this position cannot be carried out here, but it has the initial plausibility of stopping a bewildering ontological inflation of powers (the other position being that the glass has a power to shatter in R_1 and Δ_1, a power to shatter in R_1 and Δ_2… and so forth).

Power-tokens are directed to types.[73] Yet, in a way, this claim is extremely misleading when it comes to the background ontology. I claimed that D-manifestations are properties. Unless one has a very generous ontology, one should be wary of allowing two categories of properties, both universals and particulars. So I will be extra clear: in supporting a theory of D-manifestations *qua* universals I think that the corresponding theory of instantiation will guarantee that in each property instance there is no such thing as a property-token numerically distinct from the type. And the same goes for "power-tokens". I thus agree with the claim that: (Mumford 2004: 194)

> "what is necessary to its [of a power] manifestation is the universal only. This universal exists, whether or not manifested by some particular power. So if the universal is what a power is a power for, then its existence is not Meinongian."

My position ultimately is that D-manifestations, as property universals, are types of C-manifestations – viz., types of circumstances; powers causally produce C-manifestations, say, tokens of D-manifestations. This difference, together with the difference between the C- and the D-relation is sufficient to block the Meinongian Argument against a relational account of directionality.

This is also sufficient to defuse another strictly correlated worry that might be associated with an ontologically serious take on dispositional directionality. It may in fact be claimed that if latent powers are still directed to their manifestations, that would mean that actually instantiated properties would need to be identified in terms of merely possible or non-existent items, and this is in itself very mysterious. But on this account, none of that happens: power-tokens rather are identified by their bearers, in conjunction with a distinct property universal.

Now that we have dispelled the ambiguities that seemingly made the Meinongian Argument compelling, we can go back to the passages in its support and see such ambiguities in full display. For instance, consider Borghini and Williams (2008: 34):

> "when the manifestation never obtains, the disposition still has –as its very nature– a directedness towards an unactualized state of affairs (its manifestation). [...] When the dispositions are unmanifested, there is no relation at all, and so no mystery regarding what the relation is to. Thinking of unmanifested dispositions as relations to some mysterious non-existent manifestation might be one way of characterizing dispositions, but it is not one we endorse (nor does anyone else as best as we can tell). For this reason, we are not burdened with Meinongian entities."

[73] Of course, it is not just the type of behavior, the D-manifestation, that identifies a power-token, but also its bearer Lowe (2010: 12). Thus I may be leaning to universalism about properties in general.

What the authors are discussing in the first sentence is the D-relation (they are talking about the relation a disposition entertains "as its very nature"); yet, clearly, what they are discussing the second and third, is the C-relation (this is best way to understand the sentence "when the dispositions are unmanifested, there is no relation at all"); the shift from one to the other might go unnoticed if one does not pay extreme attention, but it should now be evident. And given that claim (1), the existence of latent powers, exactly shows that D and C are different relations, the passage cannot go in the direction they would want it to go.

Finally, perhaps following the idea that the minimal concept of a "manifestation" is one about events (McKitrick 2010, Williams 2017), one may have the intuition that manifestations, rather than being properties, involve properties. Given that I separated the directionality and production relations, and I introduced two technical terms for their *relata*, I take it that these are verbal disputes. Arguably what a power manifests, or produces, does not fall into the category *universal* –but this is also not what identifies it, at the pain of falling into a Meinongian problem for latent powers: it is not a *relatum* of directionality.

In short: the ambiguity in what counts as a "manifestation" follows from the identity/production ambiguity in what counts as a power-manifestation connection. If one really wants to use the term "manifestation" for one *relatum* of the C-relation (the C-manifestation), then one should feel free to do it; but she will also have to say that powers are directed and identified by types of manifestations, viz., D-manifestations. I will stick to my terminology.

5. About latent powers

In this section I will discuss an alternative solution to the Meinongian Argument that does without premise (1), viz., the existence of latent powers. As we will see however, the conclusion will most likely collapse the D and C relations, so it is in fact incompatible with the account that I just presented. Finally, I will present some reasons to prefer my way out instead of this.

Previously I presented some *prima facie* case for latent powers. In, the existence of latent powers is usually taken for granted; here is another example from Molnar (2003: 97) –a nightmarish example. Two children are born in the dark, and they both die after a few minutes. None of them has ever seen anything. One of them was born without eyes. There is a physical description of the difference between the two children that does not rely on powers, in terms of optic nerves and bulbs; but there is another possible way to express the difference between them: one of them had the power of sight, while the other did not. This difference cannot be cast in terms of manifestations, since, we assumed, no manifestation of the power of sight was ever displayed (this would be a case of manifestation-transcendent power).

The quite simple, and apparently uncontroversial thesis that there are latent powers can be opposed in at least two ways. First of all, it can be argued that the most fundamental powers that one is able to find in nature, such as electric charge, are spontaneously and continuously manifest. A charged particle might not be attracting or repelling other particles, but it is always doing something, namely, inducing an electric field. Its charge is never truly latent. Another case, perhaps a little more controversial, is radioactive decay: some materials are known to emit ionizing radiations because of subatomic instability, and for that reason are said to be radioactive. Radioactivity does not need to be activated, and there is no sense to be made in thinking about it as a latent power: as long as it is possessed (as long as the atoms are unstable), there is a spontaneous and continuous emission. So perhaps there are

latent powers, but most, if not all fundamental powers can never be. Something similar is defended, I hold, in Esfeld and Sachse (2011: 38).

Here is a different way to deny the existence of latent powers. Let us backtrack a little; the intuitive idea is that latent powers are often to be found where no qualitative change over time is present (e.g., a fragile vase quietly resting in a cupboard); but the lack of qualitative change needs not be equated to the total lack of causal, or power-related activity. Even when something is not subject to any change, this stability could be the result of several powers (of the object and of the environment) working together to preserve the *status quo*. In other words, there can be, and there are, instances of causation that do not generate any qualitative change, as claimed in Mumford and Anjum (2011: 34-38).

Thus, a radical view is available according to which powers are never truly latent –but sometimes the qualitative change that they would produce is blocked by counteracting factors. A fragile vase quietly resting in a cupboard is still manifesting its fragility, albeit not in the most paradigmatic way. To use Mumford and Anjum (2011: 37) favorite expressions, the power is trying, or pushing towards breaking, but other factors block it. Thus, an occurrence of breaking does not mark the start of the power's causal activity, but rather its being "unleashed" from other causal influences.

Are those cases convincing? If that was the case, and no truly inactive powers were to be present, the whole problem of this Chapter would dissolve; there would be no Meinongian Argument, as one of the premises of the standard formulation of the argument, perhaps the most important one, is that there are latent powers. However, because on this picture powers are always doing something, it seems that its supporters are more willing to equate them with their causal activities. For instance, in Esfeld and Sachse (2011: 38, emphasis mine):

> "Not only do the fundamental physical properties produce effects spontaneously, but they also exist only in producing effects. *Bringing about effects is what their being consists in.*"

On this picture, it is possible to deny that relations D and C (the identity-fixing relation and the causal production relation) are in fact no-coextensional, since there are no latent powers. So this relationalist picture is incompatible, and in fact very much an adversary of my account.

To be fair, I sense that there is something deeply right in the previous remarks by Esfeld and Sachse and Mumford and Anjum; after all, cases of equilibrium and stability in the macroscopic world are the result of complex and continuous interactions. Some parts of the world look still; but look close enough, and you will see activity.

It is however not clear that this thought translates immediately into the claim that there are no latent powers. And in fact, there are at least three arguments to the conclusion that this is not the case. First of all, the rejection of latent powers might blur the distinction between dispositional and categorical properties. A classic way to understand this distinction is to claim that categorical properties are always manifest and observable, or either completely absent, while the dispositional ones may occasionally be present, and yet latent in their bearer. Thus the rejection of latent powers jeopardizes the whole project. However, I do not think this is too much of a problem; amongst the many independent problems that this way of setting up the distinction between the dispositional and the ncategorical, is the following. There is a difference between a non-dispositional property (paradigmatically, geometric shapes) and a continuously manifesting power (such as the ones discussed before, charge or radioactive decay). One way of understanding that, in the case of latter, but not the former, there is some kind of (causal?) activity involving the bearer in virtue of having that property. McKitrick (2013: 137) claims that "[i]f there were such a thing as a constantly manifesting power to be cubicle [...] I would be hard pressed to explain how that is any different than the categorical property of being cubicle". And yet there is a

difference. Only in virtue of having the former, but not the latter, the object undergoes some kind of causal activity. Of course, if something is cubicle, it is caused to be so; but this does not pertain the property *being cubicle* (which, as a categorical property, is by definition causally inert), whereas it does pertain the power to be cubicle. Since (almost) everything has a cause, if something persists in being cubicle (perhaps because the pressure is not sufficient to crush it flat), then it must have a power to be cubicle, which keeps on manifesting over time. But this is not the same as saying that it is cubicle. More generally, a world of continuously manifested powers and a world of categorical properties, even if epistemically indistinguishable, would still be different; if only because of the difference in the metaphysical structure in which they are to be found: the former, but not the latter, govern and regulate instances of causation and laws of nature.[74]

The second problem (which might be an alternative version of the first one) is that the rejection of latent powers might turn into antirealism towards powers *tout court*. As I claimed in the very beginning of this thesis, the introduction of powers in the ontology has always been equated, at least since Aristotle, with the admission of some dimension of "latency" –for lack of a better word. On the contrary, the claim that powers "appear" in their bearers when they are manifest, and "disappear" as they do not, would ultimately pitch a universe with causal relations, but without powers. In the words of Molnar (2003: 97):

> "It is hard to understand the concept of a power that exists precisely when it manifests and for exactly as long as it manifests. Is such a power something genuine, a property in its own right? It seems to be just a reification of the causal relation that holds whenever the power is exercised."

And later on in the same page he argues, quoting J.L. Mackie, that such powers would be the result of "metaphysical double vision". One is seeing the causal relation two times: as the causal relation, and as the power.

The third reason to accept latent powers, and deny the identification of the two relations D and C, is briefly expressed by George Molnar in the same passage. It can be reconstructed as follows. We admit powers in our ontology, amongst other things, to provide (partial) causal explanation to the causal going-ons in the world. We want to claim things such as: the bottle shattered because it was fragile. But if a power is equated with its causal activity, than this explanation would not be available, as it would amount to explaining something with itself. One can weaken this position, deny that powers are causal relations (deny that D and R are the same), while still preserving the idea that there are no latent

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[74] However, McKitrick (2013: 137) continues, there might be a way to distinguish continuously manifested powers from categorical properties:

> "[...] what if a manifestation is not a state of affairs like being cubicle, but something less tangible, like the force of gravity? What if constantly manifesting powers have manifestations that are forces, not effects? It is not clear that there is any place for such a constantly manifesting power in a categorical monist ontology. Its manifestation seems insufficiently categorical."

We can see, in passing, how this passage relates to two strictly correlated questions that I only had the opportunity to mention in the first half of this Chapter, about the nature of manifestations: first, are manifestations observable occurrences, such as states of affairs or events, or mere contributions from the powers? And secondly, are manifestations forces, or the behavioral effects of those forces, or neither? The answers to those questions will of course bear consequences relatively to my claims that directionality is a non-causal relation, and that D-manifestations are property universals.

powers: powers exist and are instantiated only as long as they are manifest. I am not going to push forward the objection that a causal *explanans* needs to be temporally prior to the *explanandum*, because it rests on precarious assumptions on the issue of temporal priority in causation. This however generates a complication that will not allow, so to speak, to easily exhaust the being of a power with the occurrence of a causal relation.

Considered all together, these points make it really difficult to deny the existence of latent powers: without the possibility of being latent, powers would be highly parasitic on the causal processes that they are poised to explain. Furthermore, it would be too far-fetched of a rejection of so many commonly accepted claims about powers, that it is really not worth exploring. Do we really want to support an ontology in which a glass bottle is fragile only as long as it is breaking? I rather propose to try to account for the (admittedly fair) points by Esfeld and Sachse (2011) and Mumford and Anjum (2011) in a way that is still compatible with latent powers.[75]

6. The Harmony Problem

An objection my account of powers might receive, which specifically targets the distinction between relations D and C, and the respective D– and C– manifestations, is what I call the Harmony Problem. It is by no means not a new point, but an instance of the Governing Challenge for dispositionality that was introduced in Chapter 1. I will argue that even if the Harmony Problem indeed raises a challenge to my account of powers (alongside many others), it will ultimately provide reasons to prefer relationalists to non-relationalists (and primitivists) accounts of dispositional directionality.

The general idea is quite simple. Recall the account: we have an identity-fixing non-causal relation D, which enters the nature of powers (viz., dispositional properties), and we have another relation C, a causal relation that takes place whenever powers are manifested; the *relata* of D are types of the circumstances that enter causal relations (the C-manifestations). So, D– and C–relations run parallel, and a striking harmony in the world ensues; powers are directed and identified through certain types of behavior, and, when manifested, their bearers display tokens of exactly those types. But why is that, considering that D itself is not a causal relation? What is about D, that determines these causal patterns? In other words, why is that that whenever something is disposed to M (the universal), that disposition is manifested by M-ing? This is the Harmony Problem –which would ideally score a point for the non-relationalist about dispositional directionality. For, according to her, the relationalist, the one who claims that the mark of R-powers is given in terms of a second-order directionality relation, still has to rise to a challenge that closely resemble the Governing Challenge as presented by Barker and Smart (2012: 719-720) against dispositional directionality (see Chapter 1 for more details).

By way of contrast, consider what the position of the primitivist non-relationalist is: (as in Borghini and Williams 2008: 34)

> "[w]hat we are really faced with is not a matter of Meinongianism, but what the nature of dispositionality is. We have reached a rock-bottom problem. Somehow, however it may be, dispositions produce

[75] For more on the importance of latent powers, see Jennifer McKitrick's contribution in McKitrick, Marmodoro, Mumford and Anjum (2013), and McKitrick (2013). An intermediate picture would be one in which latent powers exist, but are not fundamental; latent powers and their mysterious directionality can be grounded in their microstructural bases, and, ultimately, in powers which are never latent.

manifestations when met with appropriate stimulus: we take the nature of dispositionality to be a brute fact."

Thus a power theorist that does not accept directionality will need to claim that it is a primitive fact that certain powers give rise to certain kind of behavior. According to this picture, it would just be "in the nature" of some powers to produce certain results rather than others, with no more details forthcoming. Yet primitivism is open to everyone, even to the relationalist (of course this is the kind of primitivism that generates brute necessary connections between distinct existences, so it will not be available to Humeans such as David Armstrong). It is open to my position to claim that it is just a brute fact of the D-relation that it determines C-occurrences of the right kind. If they are indeed in the same spot, therefore, the non-relationalist may reasonably argue that, for reasons of parsimony, her position should be preferred; if primitivism has to be endorsed, one might as well cut the middleman (dispositional directionality).

I see things differently, however –for two reasons. First of all, primitivism about the Harmony Problem might be a solution for my account (or any form of relationalism), but it is not necessarily the only one. Thus, things look brighter on the relationalist side; she has to rise to the challenge of the Harmony Problem. How will she manage to succeed, I am not sure. Yet the non-relationalist primitivist alternative has failed from the get-go: the Harmony Problem is about explanation, and primitivism offers none.

Secondly, I would argue that this is the wrong way to reason about parsimony. In my opinion, parsimony can only deal a killing blow to a theory; all things considered, when all is said and done, if two theories do the same job, if they have the same explaining power, and if they suffer from the same problems in the same way, then parsimony kicks in. *Ceteris paribus*, less entities are preferable to more entities. Otherwise, the dialectic gets murky as we try to decide when a problem is serious enough to warrant ontological inflation. But we are far from establishing that *cetera* are *paria* for the relationalist and the non-relationalist. Whatever the final word will be, it is highly unlikely that the two positions will end on an absolutely equal footing; it is thus unlikely that parsimony will be allowed to deal the killing blow to the relationalist. Furthermore, if the relationalist will be able to rise to the Governing Challenge, she will be able to argue to relationalism and non-relationalism do not have the same explaining power; for the former explains, while the other postulates. In this situation, parsimony means little. (I will come back to the Governing Challenge, and the prospects of postulation, in Chapter 9.)

The Harmony Problem is, at the end of the day, an instance of the Governing Challenge –thus, a difficulty that power realists will have to rise to meet. The non-relationalists, primitivists like Borghini and Williams, are constitutively incapable to rise to such challenges –for their positions explicitly deals in primitives. Thus, contrary to appearances, I think that these two points (but especially the first one) suggest that the Harmony Problem favors relationalism about directionality, assuming that its supporters will be able to somehow rise to the explanatory challenge it poses.

7. Conclusions

In this Chapter, I have shown that there is no conclusive argument for, nor against, taking at face value the idea that powers are directed to their manifestations. Specifically, the Meinongian Argument against the relation of dispositional directionality has been shown to be inconclusive –once it is properly recognized that the identify-fixing relational bridge between a power and its manifestation is not causal

in nature. Furthermore I have argued that manifestations, one end of the identity-fixing directionality relation, are neither *contributions* nor *circumstances*, but rather property universals.

I have provided a relationalist account that follows these guidelines. The alternative is a non-relationalist project about directionality according to which it is a primitive fact how a power gets paired, and produces, its own manifestation. This blocks any attempt of providing any form of clarify on important issues such as the nature of dispositionality, and the explanation needed to defuse the Harmony Problem. The relationalist is, on the contrary, at least in the position to provide further information and move one step further in the explanation process. How that will pan out, is the story for another time. I will say more about the Governing Challenge, and the choice between powers as explanations and powers as a postulation, in Chapter 9.

Whether dispositional directionality warrants being taken as the genuine mark of the dispositional, the special ingredient of R-powers, remains to be seen. This can only be evaluated by discussing the two variants of power realism introduced before, the Pure Powers view and the Powerful Qualities view. This introduces the topic of the next two Chapters.

CHAPTER SEVEN
PURE POWERS AND THEIR IDENTITY

1. Introduction

If one holds the view that there are powers –genuine R-powers–, perhaps the most radical position available is one according to which (at least some) properties are fully exhausted by their dispositional character: they are powers, and nothing but powers. This is the Pure Powers view of properties (for brevity, PP). In this Chapter I will discuss PP, its strength, and a well-known argument against it. Since supporters of PP are usually supporters of relationalism about dispositional directionality, this will be an opportunity to explore more in depth the idea that powers are genuinely directed to their manifestations. Finally, I will conclude that one argument against PP, the identity regress argument, forces the supporters of PP to a wildly implausible metaphysics. As it stands, PP is the power ontology that comes closer to a "new theory of everything" as introduced in Chapter 1; that is to say, an account of properties as genuine R-powers that forces its supporters to a number of somewhat radical assumptions about objects and properties. Given that the identity regress argument crucially revolves around the claim that powers have their identity "fixed" by their manifestations, this Chapter is also an opportunity to explore intriguing themes about the identity of powers, and the fixing thereof.

2. Presentation of the view

2.1 Pure powers

It is easy to trace the origins of PP in the literature on powers. Shoemaker (1980: 213, my emphasis) claimed that his account of properties as clusters of powers "is intended to capture what is correct in the view that properties *just are* powers, or that all properties are dispositional" (to be honest, I'm not sure how the "or" is supposed to separate two equivalent statements of the same view, but never mind that). Those inspired by his words have put forward similar claims, as in Mumford (2004: 170), who claims that "the view of properties I find most attractive is one in which they are natural clusters of, and exhausted by, powers". It is important to note that PP is but one of the many alternatives available to friends of powers, even if it (or something very similar) has for some time been used as a characterization of power realism *tout court*, as in Armstrong (1997: 69, 1999: 26).

Although it makes for a very interesting subject of debate, PP is not, as of now, a popularly advocated position; presumably the more refined version of it is to be found in Bird (2007a, 2007b); although one can make the case that Mumford (2004) also counts as a version of PP. Thus, these will be my main references for the discussion in this Chapter.

First of all, a clarification. Without a clear understanding of what the dispositionality of a property amounts to, and similarly for its categoricity, PP may strike one as somewhat mysterious. One could ask: are properties "exhausted by" their dispositionality, or are they "just" powers or "pure" powers… instead of being what? What is the alternative? Chapter 4 tentatively introduced a mark of genuine R-powers, given in terms of their identity; powers have their identity fixed by <input, output> stimulus/manifestation pair (or pairs, in the case of multi-track powers). On the contrary, categorical properties, or *quiddities*, have their identities fixed primitively. The reader should also remember that, although some people have argued for an explicitly modal distinction between dispositional and categorical properties (necessary vs. contingent stimuli and manifestations, or nomic and causal roles), I avoided this formulation. This modal difference between the two kinds of properties is not mandatory:

after all, a categorical monist is free to embrace metaphysically necessary laws of nature. The modal difference is, at best, a symptom of a deeper divide in terms of the identity of properties. A similar oscillation can be detected in the use of the word "quiddities"; with it, I mean properties with a primitive source of identity, which have sometimes been described as "self-contained things, keeping themselves to themselves" (Armstrong 1997: 80), or as "intrinsically inert and self-contained" properties (Black 2000: 91). Although this usually means that quiddities are contingently associated to their dispositional profiles, this doesn't need to be the rule.[76]

Here is another reason why the modal distinction will not do. By itself, the claim that a dispositional property has the same manifestation as a matter of necessity, doesn't entail that that no two properties can have the same manifestation (as a matter of necessity). If there is something more providing for their difference, like a quiddity, that could indeed occur. Thus, the previous characterization of dispositionality, as intended by the PP theorist, is rather that a power is uniquely identified by its manifestation(s). PP thus bears the modal consequence that a property has the same manifestation with the strength of necessity, while no two properties can possibly share the same manifestation. So, if there is a property P_1 in world w_1 with manifestation A, and property P_2 in world w_2, with manifestation A, one can be sure that P_1-in-w_1 is identical to P_2-in-w_2. According to PP, the identity of properties is uniquely fixed by their manifestation(s), in a way to exclude all primitive sources of identity.

2.2 Strengths of PP

The reasons to embrace such a radical notion of property are mainly constituted by the advantages of excluding quiddities from one's ontology. Without quiddities, one doesn't have to worry about "total swaps" where pairs of quidditistic properties completely swap their dispositional profiles from one world to another, while retaining their identity; alternatively, two quidditistic properties within a world could share their dispositional profiles, while retaining a primitively distinct quidditistic character.

What is wrong with these cases? First of all, there's the old anti-haecceitist/anti-quidditist *adagio* according to which pair of worlds in which such swaps occur are not genuinely distinct possibilities: the two properties have merely switched labels. And similarly for two properties in a world with the same dispositional profiles: they behave the same, they do the same things –there's really no perceptible qualitative difference between them; so why should we consider them numerically distinct?

These considerations, as intuitive as they are for many anti-quidditists, need to be robustly substantiated: for they run the risk of begging the question against the quidditist (e.g., "why are two dispositionally indistinguishable properties numerically distinct? Why, because they are two different quiddities"). However, there's a more grounded, epistemological doubt lingering around quidditism (first discussed in Shoemaker 1980: 215). Given that our interaction with properties (and thus, our knowledge of properties) exclusively obtains through causal or power-governed processes, quidditism seriously hinders our epistemic access to properties. This generates a number of difficulties for quidditism. First of all, it makes similarity between objects a very difficult thing to settle. For one, we could mistakenly assume that two objects are sharing a property, only because they have two properties with the same dispositional profiles; alternatively, two objects in two worlds may appear and behave in the exact same way, but share in fact no properties (although they possess dispositionally indistinguishable quiddities); thus they wouldn't really be similar.[77] The same goes for dissimilarity; pairs

[76] The first to explicitly point out that quiddities don't need to be accompanied by this deeply contingent metaphysics was perhaps Schaffer (2005); I will come back to this in Chapter 9.

[77] A gut reaction, of course, is that two objects who appear and behave in the same way *are* similar (and perhaps if they are sufficiently alike, and in two different worlds, they are counterparts). This however yields an even

of object may strike us as dissimilar, as they appear and behave in very different ways; and yet they possess the exact same properties.

Yet an ever deeper worry lingers around quidditism; first of all, given that, again, we physically interact with properties through their (causal) behavior, our individuation of properties at best narrows down equivalence classes of dispositionally indistinguishable properties, and nothing more. If more than one property exists in each class (if there are distinct, yet dispositionally indistinguishable properties), then which properties are actually instantiated becomes a difficult thing to settle; undecidable, at best –arbitrary, at worst. The problem is, ultimately, that we have no epistemic access to a property's nature, if not through its behavior in the physical reality we inhabit: thus, the nature of a quidditistic property would ultimately be epistemically unapproachable. This profound ignorance about properties, their instantiations, and their nature is a bullet that some quidditists are willing to bite –e.g., notably Lewis (2009: 211) comments, with a somber attitude: "who ever promised me that I was capable in principle of knowing everything?". Yet there seems to be an inherent danger in a similar position, which may turn these epistemological worries back into metaphysical worries. If our investigations in the physical world go no further than dispositional indistinguishability (and if, as suggested in a previous footnote, dispositional indistinguishability is sufficient to settle matters of similarity between objects), what is the point in positing finer-grained quidditistic distinctions within classes of dispositional indistinguishability? This seems pointless metaphysics![78] No such shenanigans happens under the flag of PP, where quiddities are excluded.

One could argue (e.g. Tugby 2014) that some of these advantages can be obtained on the cheap. As we have seen, some of the difficulties were caused by the possibility of total swaps of dispositional profile between properties. However, PP is not the only position according to which properties are assigned causal and nomic roles with the strength of necessity, and where total swaps are forbidden. As I anticipated, this move is available to quidditists who do not believe in the existence of genuine powers –were they to posit the right relations to necessarily link properties to their dispositional profiles, perhaps by declaring laws of nature to be metaphysically necessary.[79] The quiddity would still be *per se* epistemically unapproachable, but there would be other ways to indirectly get a grip on it, through the causal and nomic roles that necessarily accompany it.

To my eyes, however, some advantages of PP cannot be obtained on the cheap. Consider the case of two properties sharing their dispositional profiles while nevertheless being numerically different, because they have (primitively) different quiddities. Two objects could have them, while behaving in the same way; an object could exchange one for the other over time, while behaving in the same way. This is still somewhat problematic. And, mind you, this is not something that one can solve by tying quiddities more strictly to their position in some nomic structure. That won't help –since it would still be possible for two or more quiddities to be (necessarily) associated to the same position. One can easily solve this difficulty by embracing PP and getting rid of quiddities –as their job is exactly that of providing "differences without a difference" –viz., brute numerical difference.[80]

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more radical conclusion for the quidditist: intra-world and trans-world similarity has nothing to do with the sharing of identical properties.

[78] Hawthorne (2001: 368-369), also see (Schaffer 2005).

[79] Again, see Chapter 9 for more on this scenario.

[80] Presumably a quidditist could solve this problem by taking laws of nature as metaphysically necessary *and* dictating that no two quiddities can occupy the same place in the nomic structure. There is nothing explicitly wrong with this move, it just seems excessively *ad hoc* and artificial.

All in all, PP is the perfect position for friends of powers with anti-haecceitist/anti-quiddditist sympathies, according to which primitive sources of identity are, to use Hawthorne (2001: 362) words, "a will-o'the-wisp."

2.3 Weaknesses of PP

There is a huge family of arguments against PP, all loosely based around the idea that a world of pure powers would be a world sorely lacking in… something (*what* exactly, depends on the argument). Such arguments generally take the form of circularity or regress argument, usually called *regress arguments against pure powers*. Their overall form is the following. According to PP, a power is exhaustively characterized through its manifestation –in a way that makes the former somehow depend on the latter for… something. But in a world of pure powers, each manifestation in turn is, or involves the instantiation of, a further power. This either ends in an infinite regress (if powers are infinite in number), or circularity (if they are not), in what would ultimately amount to an endless, and presumably vicious, passing around of powers.

The reader will have noticed a very big assumption in the argument form: for it is required not only that some properties are pure powers, but that *all* of them are. If not, a non-power could at some point be the manifestation of a power, and break the regress (or circularity). Strictly speaking, there is nothing in PP that calls for a monist instead of a dualist ontology of powers; one may wonder what exactly the strength of the arguments is –if such an easy fallback solution is available. Of course, it is not a flawless solution; as other kinds of dualism, the dualism of powers and non-powers generates an interface problem (see Molnar 2003). And, of course, it would greatly diminish the attractiveness of PP to be committed to dualism, as opposed to being neutral on the matter. A regress argument could rest well content on this result. After all, power ontologies were developed to restore the independence and respectability of powers, and PP seems to be the final step in this direction: for it suggests that powers do not need categorical residue components in their nature –they stand in need of no crutches, not external, nor internal. That being said, however, a supporter of PP could bite the bullet and posit some non-powers to break the argument.

I have no interest in arguing for nor against dualism: the subject of this Chapter is PP, not PP+monism. So why is the discussion on regress arguments relevant?

Here is the dialectic of this Chapter. I will introduce this regress argument against PP under the assumption that there are no non-powers –I will present several variants of the argument, which pose different degrees of threat to the position. A known "holistic" strategy to deal with this argument, without rejecting monism, will be shown to be quite inconclusive. For many of such variants, the rejection of monism seems like a viable way out. However, the strongest variant of the argument suggests that, *even if one abandons the monist assumption to break the regress, the result is highly dubious –and revolutionarily unorthodox– metaphysics*. In short, there is no pure powers ontology, with or without non-powers, that is compatible with our ordinary worldview. This is of course not a knock-down argument against the position (in fact, some may even consider it to be a virtue), but of course it will play a role in the overall evaluation of the pure powers option.

The argument against pure powers that I am going to discuss is the *identity regress argument* (for brevity, IRA) that was first introduced in passing in Lowe (2006: 138), and has, since then, been the focus of a small but intense literature.

> "If all properties were powers, then all *manifestations* of powers—being properties of their bearers—would themselves be powers, likewise 'getting their identity' from *their* manifestations. […] The problem […] is that *no property can get its identity fixed*, because each property owes its identity to another, which in turn owes *its* identity to yet another—and so on and on, in a way that, very plausibly, generates either a vicious infinite regress or a vicious circle."

As introduced in Chapter 4, IRA is not, again, the only regress argument against pure powers. First of all, there's an epistemological regress as well (Swinburne 1980), based on the idea that, since we access powers through their manifestations, in a world of pure powers "the epistemic buck is continually passed" (Tugby 2014: 2) without any knowledge of properties ever being achieved. I have nothing to add on this front. Also, there's the aforementioned (and unsatisfactory) regress argument from the lack of actuality first formulated by Armstrong. Other, more esoteric regress arguments against pure powers, according to which a world of pure powers would be "too fugitive", or "ontologically *manque*" (Molnar 2003: 176), in the sense of lacking being, reality, or perhaps determination, will be discussed throughout this Chapter, as I believe that they can be subsumed under a strong variant of IRA.[81]

3. Some clarifications

2.1 Three senses of "identity"

Before digging our teeth in the argument, there's something that needs clarification. The reader may have perceived an ambiguity in some of my previous claims –couched in the formulation of the dispositional/categorical divide as about the *identity* of properties. Similarly, the claim that manifestations "fix the identity" of powers, so crucial in Lowe's formulation of IRA, may sound equally ambiguous, or simply confusing. There is, in fact, an ambiguity in the word "identity", more specifically in the expression "the identity of…" (e.g., "the identity of powers"). For, as far as I can see, there are at least *three readings* involved here.[82] First is the relational reading, according to which "identity" stands for the relation philosophers, logicians and mathematicians usually express with the equality sign "="; I am talking about the relation of absolute numerical identity, viz., the circularly second-order definable, Leibniz-Law-associated, strictest equivalence relation that necessarily everything has with itself, and nothing else. Sometimes I will for brevity use the expression "identity$^{=}$" to refer to this relation. Its negation I will call "distinctness$^{=}$" –what is usually expressed with the "≠" sign. According to this reading of "identity", expressions such as "the identity of powers" stand for facts of numerical identity and difference between pairs of powers, viz. facts "of one-ness" or facts "of two-ness" about them. Somewhat artificially, the singular variant "the identity of a power" can stand for facts of numerical identity involving a specific power: facts "of one-ness" about that power. Maybe it is just *a single* fact, as presumably identity is not as fine-grained so as to distinguish multiple occurrences between a thing and itself. The identity of a power, according to this reading, is its one-ness, the fact that it is one (this arguably long-winded reconstruction perhaps comes more naturally if we consider the similar expression "the self-identity of a power"). Occasionally I will refer to identity$^{=}$ facts with expressions such as "the identity$^{=}$ of…" or "the identities$^{=}$ of…"; contrariwise, I will refer to distinctness$^{=}$ facts

[81] For such arguments, see Campbell (1976: 93), Robinson (1982: 114-115), and Heil (2003: 98-108).

[82] To have noted similar oscillations in the use of "identity" in this, and related contexts, Lowe (2010), Jacobs (2011), Inghtorsson (2015) and Busse (MS). However, it is hard to find a complete and exhaustive disambiguation of the "fixing the identities" expression in the debate on about the identity regress –which partly motivates this Chapter.

with "the distinctness$^{=}$ between…". Please note that, for simplicity purposes, I equate facts of identity$^{=}$ and distinctness$^{=}$ with facts of one-ness and two-ness only for simplicity purposes; a more thorough account will presumably distinguish between them, although they are surely closely related.

Secondly, there's identity as individuation. Individuation is, on the face of it, an epistemic phenomenon, or more aptly, an operation one can perform. Through this operation, something is singled out from its environment; it is selected, amongst others, as a distinct object of attention, perception, or thought. When one individuates a power, one is finding out *which* power it is –one is zeroing in on that power, amongst others. There is however a deeper metaphysical element in individuation: for there must be something that allows objects to be individuated (in the epistemic sense); namely, they must be *individuals*. Each individual is one, and the very individual it is, rather than another: in a collection of individuals, there is a fact of the matter as to which is which. Individuals, like most of the things we encounter in our everyday life, are ready to be individuated by a subject; non-individuals, if there are such things, are not. Thus, *a*'s individuality is composed of two elements: its being identical to itself, and its being identical to *a* (Lowe 2003). It is not east to formally appreciate the difference between these two elements without predicate abstraction, but here is the tentative definition:

a is an individual $=_{df}$ [λx. x=x](a,a) ⋀ [λx. x=a](a)

Thus [λx. x=x](x,x) ⋀ [λx. x=a](x) is a schematic *definiens* of individuality, e.g., the property *being one and being identical with* a: I will call such properties, which have received various names throughout the years, "individuality properties", or simply "individualities" of objects. Individuality properties crucially involve reference to specific individuals: to assign them basically amounts to a labelling procedure. Because identity is a necessary relation, *a* possesses its individuality necessarily, and nothing else can possess it. Individualities can be considered trivial or limiting cases of *individual essences*, viz., properties that only some specific object can possess; necessary and sufficient conditions for being that object (as in Plantinga 1974: 70). But in what follows, I will reserve the venerable name of "individual essence" for something more deserving. Summarizing, in this second reading of the expression, to talk of identities of objects is to talk about their individualities; to say that "*a* has an identity" is to claim that [λx. x=x](a,a) ⋀ [λx. x=a](a). Viz., a power has an identity in the sense that it is (metaphysically) individuated: it is *that* one power.

The reader will have noticed an intimate relation between the identity of x in the first sense (its one-ness) and the identity of x in the second sense (its individuality). According to my schematic definition of individuality, each individuality property involves (but is not exhausted by) an instance of the identity relation: to be an individual entails being one. The entailment does not go the other way round, for philosophers have provided plenty of examples of objects for which identity relations hold, but which are *not* individuals; viz., collections of objects for which there's a fact of the matter as to how many there are, but no fact of the matter as to which is which.

Thirdly, and finally, there is a non-relational sense of "identity" that has been more recently popularized by Kit Fine. In this sense, the identity is the *nature* or *essence*, to be understood, in a somewhat neo-Aristotelian fashion, as involving a real definition of the object; the identity of x provides an answer to questions such as "what is x?". Following Marmodoro (2010) I claim that the identity of x (in this sense), is not distinct, or at least is not a distinct existence, from x itself; if the identity of Socrates is that of rational animal, the rational animal is not something distinct from Socrates –Socrates is the rational animal. Thus the identity of Socrates is not an essential property, in the sense of a separate entity to which Socrates enters a (pseudo)-relation of instantiation.

3.2 Fixing identities

So we have at least three (strictly related) readings for expressions such as "the identity of a power", or "the identity of powers". First, we have their one-ness (or two-ness). Second, there's their individualities. Thirdly, there's their nature, what they are.

Now we must come to grip with the idea that objects (in this case, powers) *get their identity fixed by something*, or *owe their identity to something*. The notion of *fixing*, *owing to*, or sometimes *accounting for*, suggests that we are dealing with a relation with an explanatory or determinative direction. I will use the background on grounding laid out in Chapter 2; I will assume that it is a grounding relation (strict partial order) between facts, composed of objects and properties; sometimes I will speak of *relata* as properties of objects –this must be taken as a shortcut for: facts composed of such properties and objects.

Now that we have distinguished three senses of identity, we can see that the question "what fixes the identity of power x?" can be decomposed into (at least) three more specific questions:

1) what makes x one?
2) what makes x the specific power it is, and not another?
3) what makes x what it is?

Also, when one wonders about "what fixes the identities of powers" (plurally), with a relational understanding of identity in mind, one is probably thinking about the question:

1') given arbitrary powers x and y, what makes x and y one (or two)?

Questions (1)-(1') demand what Fine (2016) has recently called "criterial identity conditions"; that is to say, not just any materially adequate necessary and sufficient conditions for arbitrary x and y of kind K being numerically identical or different; but those that account for such an identity or difference. In that paper, Fine has but given a name to a metaphysical reading of identity conditions, according to which identity conditions for Ks answer questions such as "what makes Ks identical or different?", or "what accounts for Ks being identical or different?". This is exactly what we are dealing with in questions (1)-(1').[83]

Question (2), on the other hand, calls for a power's individuators. This is where we face the relation of *metaphysical individuation* proper: x is individuated by some y in the sense that y is responsible for, or is what fixes, the individuality of x –viz., is what makes x one, and very thing it is, rather than another. Questions such as (2), therefore, call out for properties less trivial than the mere "labelling" individuality properties that they are called to account for. Whether or not individualities of objects arise from underlying, more qualitative and less trivial, features is of course not something that I can settle. For one, Adams (1979) pioneered the position according to which there are *primitive thisnesses* (he calls "thisness" the second, crucial, component of my individuality properties). Following Adams, many would leave questions such as (2) unanswered. Not all cases are the same; some kind of entities are clearly provided individuators: e.g., it is easy to metaphysically individuate a set, for having the members it has provides necessary and sufficient conditions for being that set. Yet in other cases (material

[83] For this metaphysical reading of identity conditions, see Williamson (1990: 148-149), Lowe (1998: 35-36), Carrara and Giaretta (2004), Horsten (2010), and Fine (2016).

objects, artifacts, or people) no non-trivial individual essences are easily discovered –which led someone to give up hope that such things would ever be forthcoming (as in Mackie 1987: 174-175).
Luckily, powers are more like sets than people, since they can easily be individuated through their manifestations. This holds, clearly, for power-types, while power-tokens are individuated through their manifestation(s) and their bearer, like all other property instances are individuated (Lowe 2010: 12). A positive answer to (2), in terms of manifestations, allows the supporter of PP to escape *quidditism* –now understood as the claim that properties have primitive individualities. Similarly, haecceitism can now be defined as the thesis that (some) objects have primitive individualities. We now have some bearing on the claim that pure powers get their identity from their manifestations, while the quidditist's properties have their identity fixed primitively; for the former, but not the latter, are the properties they are, and not others, in virtue of further facts about them.
Additionally, metaphysical individuation has strict ties with the notion of *transworld identity* (TW-identity), and associated *TW-identity conditions*. It's an easy association to make: when we try to evaluate TW-identity claims, we try to re-identify a known object that is allowed to undergo qualitative variations in a counterfactual scenario; thus, we are looking for necessary and sufficient conditions for being that object. Haecceitists and quidditists, who reject non-trivial individual essences, disparage of such attempts of finding non-trivial TW-identity conditions, some of them may have been inspired by claims that TW-identity can be merely "stipulated", e.g. Kripke (1980: 15–20, 42–53). On the contrary, positive answers to questions such as (2) also provide TW-identity conditions.
Keep in mind that TW-identity conditions are, after all, identity conditions, albeit of a very special kind. This might generate some confusion. If some identity conditions provide individuators and individual essences, they count as TW-identity conditions; otherwise, they don't (Lowe 2010). This is peculiarly the case of Davidson's identity conditions for events in terms of sameness of causes and effects. Davidson (1980) talked as if such conditions could individuate events; but this clearly isn't the case, at least not in our current understanding of individuation: an event need not have the causes and effects it actually had, so its relation to causes and effects cannot be part of its individual essence. Davidson's identity conditions thus merely work as "intra-world" identity conditions, rather than TW-identity conditions; they are merely ways to recognize, within a world, whether arbitrary events x and y are one or two events.
One should also keep in mind that there are correlations between *essences*, as introduced before, and individuating essences; after all, one can formulate TW-identity conditions in order to grasp the internal profile or nature of something, its "what it is" that remains constant throughout all qualitative changes across worlds. Yet to my mind, not all essences are individuating. For instance, "(a) rational animal" seems like an acceptable answer to the question "what is Socrates?", yet his being a rational animal fails to distinguish and individuate him amongst other rational animals; for even if Socrates is a rational animal is not *just* that. Some other "element of its being", so to speak, must fulfill an individuating role (if anything is to fulfill it at all).

Before moving on to question (3), and its answers, I would like to discuss the relation between questions (1)-(1') and (2), that is to say, the link between *fixing identities*[=] and *fixing individualities*, and between *criterial identity conditions*, and *TW-identity conditions*.
First of all, one might wonder whether a positive answer to questions such as (2) involves a positive answer to questions such as (1)-(1') –and moreover, the same answer. On the face of it, this is not the case. Surely, as we have seen, individuality calls for one-ness. But now are talking about *fixing* the identities (in both sense) –and, it is not straightforward that, if there is something that fixes

individualities, there must be something fixing identity$^{=}$ facts as well; nor it is straightforward that it must be the same thing. On the fact of it, the rejection of haecceitism/quidditism appears to be compatible with the claim that identity$^{=}$ is a primitive relation. Jonathan Lowe has however provided two arguments for the opposite conclusion that whatever fixes individualities, also fixes identities$^{=}$. Both of them, in my opinion, are unsatisfactory. The first, as in Lowe (2003: 76):

> "Given that something does indeed qualify as a single object of some kind, it is hard to see how what makes it the very object that it is could fail to be what also makes it *one* object, for such an entity could not be the very object that it is without thereby being one object."

In Chapter 2, I have submitted that we can hardly capture a relation of metaphysical dependence or determination through merely modal tools. Simply put, my problem with Lower's first argument is that one-way modal covariance between one-ness and individuality (the fact that nothing can be the individual it is, without also being one) is not enough to settle whether one-ness and individuality are fixed by the same things.

The second argument is provided in Lowe (2010: 16-17), and relies on notions of intra-world and TW-identity conditions. Suppose to have two worlds, w_1 and w_2, and some items of kind K, k_1 on w_1, and k_2 and k_3 on w_2. Suppose to have a condition ϕ fixing TW-identities between Ks; and according to ϕ, $k_1=k_2$, but $k_1\neq k_3$. By the transitivity of identity, it follows that k_2 and k_3, on world w_2, are numerically distinct. Thus, through ϕ, one can fix all identity$^{=}$ facts between Ks within world w_2. Given that w_2 was chosen arbitrarily, such identity conditions hold necessarily at all world with Ks; more precisely, at all worlds reached by ϕ as a TW-identity condition for Ks. Thus ϕ also determines, with some modal strength, all identity facts within worlds.

This argument too, I believe to be flawed. In short, the mistake lies in confusing *entailment* (or *inference*) with *grounding*. The conclusion that $k_2\neq k_3$ is reached logically by the application of the transitivity of identity: but here is no argument to the conclusion that this identity fact is metaphysically fixed by ϕ. Of course one can, by using ϕ as TW-identity condition for Ks, *and helping oneself with the logic of identity*, settle all identity$^{=}$ facts inside a world in which there are Ks. Thus one can indeed conclude that, if ϕ is a "fixing" TW-identity condition for Ks, it also holds within all worlds with Ks –viz., ϕ is still a materially adequate and applicable intra-world identity condition for Ks at those worlds. However, one cannot conclude that ϕ is also an intra-world *criterial* identity condition for Ks: for nothing in the argument dictates that ϕ itself is accounting for, or determining, such identity facts. (One can detect some ambiguity in Lowe's formulation here. If ϕ is a TW-identity conditions, then ϕ is also an *applicable* intra-world identity condition, as he rightly states; but it might not, as he also occasionally claims, *determine* identities$^{=}$ of Ks at any of those worlds.)

I will not say more on this matter –for I see no argument in favor nor against the claim that: if there is something fixing individualities, something is fixing identities$^{=}$; similarly, I will neither claim nor deny that whatever fixes individualities, is also fixing identities$^{=}$. What about the opposite? Does a positive answer to questions such as (1)-(1') entail a positive answer to questions such as (2)? In short, does the existence of something fixing identities$^{=}$ entail that something (perhaps the same thing) is also fixing individualities? This also seem dubious. We have already seen that there are some things which are provided identity conditions, but which have no individualities. The claim we are evaluating now is slightly different: are there any things with *criterial* identity conditions ϕ, but such that ϕ does not help fixing their individualities? Consider for instance, Davidson's stance on the identity of events. Sameness of causes and effects makes up for good identity conditions, but fails to individuate events –which opens up for at least three alternatives: a) something else individuates events, b) events have primitive

individualities, and c) events have no individualities. Is it open for the supporter of any of the (a)-(c) choice to claim that, nonetheless, sameness of causes and effects is a *criterial* identity conditions for the identity$^{=}$ of events, viz., is what makes events identical or different, at all possible worlds? This seems a *prima facie* consistent conjunction of claims.

As before, I am not sure how much we can diverge the fixing of identities$^{=}$ and the fixing of individualities. As we have seen, individualities are composed with the help of the identity relation ([λx. x=x](x,x) ⋀ [λx. x=a](x)). Crucially, they are properties of being identical to some specific entity. Thus one may object that they receive similar explanations to identity$^{=}$ facts: whatever makes it so that (a,a) exemplifies [λx. x=x](x,x), is also what makes it so that *a* exemplifies [λx. x=a](x). In short, a's one-ness must receive a philosophical account not entirely dissimilar from what accounts for its individuality. But [λx. x=x](x,x) and [λx. x=a](x) are different properties (after all, one is a relation and the other is monadic), so it is not clear why they must be fixed by the same things.

Fortunately for us, this difficult question is not something that needs a general answer, for, in the case of powers, *identity$^{=}$-fixing* and *individuality-fixing* go hand in hand. Pure powers get both their identities$^{=}$ and their individualities fixed in terms of their manifestations.

Finally we move to question (3), which calls, as an answer, a Finean essence as I described before.[84] As above, essences are most likely not distinct existences from what they are essences of; similarly, an answer to the question "what makes x what it is?" would probably not involve a distinct existence from x (e.g. Jacobs 2011: 83). Something similar holds, I would say, for *individual essences*: whatever is responsible for some K being the K it is, rather than another, will hardly be something distinct from it –it must be some internal feature or aspect of it (as suggested in Lowe 2003).

As a conclusion of this section, I would like to discuss the relation between the answers to (1)-(1'), (2), and (3), specifically in the case of powers according to PP. It seems that all such questions receive answers in terms of manifestations, or powers having manifestations; firstly, for arbitrary powers x and y, they are either one or two depending on whether they have the same manifestation. Secondly, power x is the power it is, rather than another, because it has *that one* specific manifestation, rather than another: it is "individuated *by what it is a power to do*" (Lowe 2010: 10). Finally, what makes x what it is (viz., a power), is that it has a manifestation: its nature is primarily that of a "manifestation selector"; as we will see, for many supporters of PP (e.g., Bird 2007a, 2007b) having manifestations is an extremely crucial feature of powers.

4. Interlude: identities that can't be fixed

I would like to consider a radical objection to the meaningfulness of questions such as (1)-(1') and (2), with clearly haecceitistic/quidditistic connotations. I will therefore explain why, in what follows, I will ignore this complication. The impatient reader can skip this section and go straight to the next one, where I will start the discussion proper on IRA.

[84] Note a slight difference in formulation. Previously I took the essence of x to constitute an answer to the question "what is x?"; now I take it to constitute an answer to the question "what makes x what it is?". The answers would be different too; the first will probably be something along the lines of "(a) rational animal", and the second "his being a rational animal". I do not take there to be substantial differences between the two questions, nor the two answers.

Facts about the identities$^{=}$ of objects are, at the end of the day, little more than cardinality facts about objects. Thus, one may have some doubts as to whether such things can be fixed or determined by something else; for one could say that if one object is one, there's nothing that makes it one. It's one, and that's the end of the matter. Similarly for two objects: there's nothing that makes them two. It's a primitive fact. Numerical identity is too basic a relation to allow for fixing. This line of reasoning has a venerable tradition that is perfectly summarized by David Lewis:

> "Everything is identical to itself; nothing is ever identical to anything except itself. There is never any problem about what makes something identical to itself: nothing can ever fail to be. And there is never any problem about what makes two things identical; two things can never be identical."[85]

Something similar goes for the fixing of individualities; for one may have the intuition that, as Bishop Butler's famously said "everything is what it is and not another thing"[86], thus leaving no space for further philosophical investigation. In short, an argument could be that identities$^{=}$ and individualities of objects are just too basic to require fixing.

I will not explore this problematic, which has *per se* nothing to do with IRA. I will however briefly explore its quidditistic/haecceitistic connotations, which are clearly against the spirit of PP. This justifies my leaving it aside for the time being.

Suppose that answers such as (1)-(1') about the identities$^{=}$ of objects have no meaningful answers. Facts of numerical identity are therefore primitive, not fixed or grounded by any other "qualitative" facts of objects. Facts about numerical identity and distinctness are not bound to any qualitative fact by modal or hyperintensional relations (unless, of course, one decides to postulate, together with primitive identities$^{=}$, primitive relations between numerical identities and other qualitative facts). According to this position, so to speak, facts of numerical identity are allowed to float free: this is the perfect breeding ground for haecceitism and quidditism. On the contrary, haecceitism and quidditism are clearly incompatible with identity$^{=}$ having metaphysically necessary grounds in other facts about the objects. Such grounds could not just be provided by, say, kind-relative identity conditions. Presumably, back in the days in which it was unproblematically accepted, the Identity of Indiscernibles also had the job of grounding identity in indiscernibility: from such a perspective, haecceitism and quidditism would be unacceptable options, potentially equipping the world of brute numerical differences, viz., "differences without a difference" without grounds or explanations in the world around them.

It's even easier to see how the refusal to fix individualities (while at the same time maintaining that objects have individualities) leads straightforwardly to haecceitism, or, in this case, quidditism. As we have seen the operation of metaphysical individuation involved in questions such as (2) is needed to find non-trivial individual essences of objects, to account for their individualities (as defined in the previous sections). The failure of this project amounts to haecceitism, or, in the case of properties and powers, quidditism. This is exactly what the supporter of PP rejects.

5. The identity regress argument against pure powers

[85] Lewis (1986b: 192-193). More recently Fine (2016) has discussed this topic. See Burgess (2012: 97) for the claim that "there is a genuine and neglected puzzle about what makes arbitrary A and B identical or distinct". For a recent overview about the fundamentality of identity, see Shumener (2017).

[86] As quoted in Lowe (2003: 75).

We can now have a more in-depth look at IRA as an argument against PP; remember, Lowe's formulation of the argument was that, if all properties are pure powers, every power gets its identity fixed by some other power, in what would either generate an infinite regress, or a circularity, of identity-fixing operations. As we have seen, however, there is no one single thing that deserves to be called "identity-fixing", but more than one: this has caused some confusion in the evaluation of the argument. Thanks to the work done so far, things should go more smoothly for us.

4.1 A regress of identities$^{=}$

The first possible interpretation of "identity" and "identity-fixing" revolves around the criterial identity conditions that provides answers to questions such as (1)-(1'). Thus we have a first version of IRA, which deals with an infinite regress or circularity in the fixing of identities$^{=}$ between powers. Identity$^{=}$ and distinctness$^{=}$ amongst powers is provided through sameness of manifestations. Thus, (criterial) identity conditions for powers can presumably take the following form.

4) $\forall x \forall y\ (P(x) \,\&\, P(y) \rightarrow (x=y \leftrightarrow \forall z(M(x,z) \leftrightarrow M(y,z))))$,

where P(x) stands for "x is a power", and M(x,y) stands for the manifestation relation "x is a power for y", or, conversely, "y is the manifestation of x". (4) reads: for every arbitrary powers x and y, x and y are one and the same if and only if every manifestation of x is also a manifestation of y, and vice versa. (4) is an example of what Williamson (1990) called one-level identity conditions, in which identity between entities of kind K is decided through a condition to be satisfied by Ks themselves. When interpreted as criterial identity conditions, (4) claims that arbitrary powers x and y are in virtue of having the same manifestations. Please note that universal quantification over z allows for x and y to have multiple manifestations; (4) cannot be satisfied trivially since the existence of at least one manifestation is sanctioned by x and y being powers (every power has a manifestation).

Now, this formulation may not make it clear, however there is an hidden identity in (4); after all, arbitrary powers x and y are identical if and only if they have the *same* manifestations; "same" stands of course for absolute numerical identity. A long-winded reformulation of (4) may make this clearer, as follows:

4') $\forall x \forall y\ (P(x) \,\&\, P(y) \rightarrow (x=y \leftrightarrow (\forall w M(x,w) \rightarrow \exists z(M(y,z) \,\&\, w=z)) \,\&\, (\forall w M(y,w) \rightarrow \exists z(M(x,z) \,\&\, w=z))))$

In short, (4') claims that if x and y are arbitrary powers, they are identical if and only if for every manifestation of x, there is an identical manifestation of y, and *vice versa*. Similar considerations to (4) apply here as well.

Now, if one is a PP theorist who also accepts monism, it will be that w and z are powers as well. Thus, according to (4') the identity between any pair of powers is fixed by the identity between another pair of powers. This in itself might be somewhat strange: since according to PP all properties (all powers) are ontologically on a par, there is no ontological primacy of powers over their manifestations –as hinted in Chapter 6. Thus, it is somewhat strange that the identity$^{=}$ of some powers fixes, and perhaps is more fundamental than, the identity$^{=}$ of others powers: why would some powers be privileged over others in this way, and on which grounds? There appears to be something arbitrary in this scenario; yet, in my opinion, this is nothing that the supporter of PP can't deal by biting the bullet.

Furthermore, there is nothing immediately contradictory in the claim that the identity of pairs of powers can be settled by the identity of another pair of powers; Lowe (1989, 2010) has gone to some extent to show that this kind of extreme impredicativity in principles such as (4)-(4') is not *per se* unacceptable (the "extreme impredicativity" is the fact that the quantifiers in the right-hand side providing the condition only range over the same kind of things the principle is trying to provide identity conditions for). Lowe claims that impredicative principles such as (4)-(4') are in the good company of, say, the Axiom of Extensionality for sets; what he has in mind, presumably, is a well-founded pure set theory in which all members the Axiom quantifies over are sets themselves. The Axiom can trivially prove the identity and uniqueness of the empty set at the bottom of the hierarchy of sets, and move from there.

Ultimately, it all depends on what the structure will look like; and, unfortunately, this is where the analogy breaks with (well-founded pure) set theory breaks. First of all, because the analogy would require the existence of a "null power", viz. a power with no manifestations, at the bottom of the hierarchy. Without such a puzzling postulation, (4)-(4') would generate, according to PP+monism, either an infinite regress or a circularity in the fixing of identities$^{=}$. If properties are infinite in number, one gets an infinite regress of identity$^{=}$ fixing; with all the problems usually associated to metaphysical infinitism. Under the assumption that properties are finite in number (perhaps a more reasonable hypothesis, at least the one that has been more frequently discussed), one gets a circularity of identity$^{=}$ fixing, in the sense that the settling of identity$^{=}$ facts between pairs of arbitrary powers at some point is bound to loop back to the same powers. This could in itself be quite problematic, since relations of metaphysical dependence are usually taken to be strict partial orders, viz. asymmetric (thus irreflexive) and transitive relations which can be represented as directed acyclic graphs. Ultimately, some power's one-ness, or two powers' two-ness, cannot rest upon themselves.

One may pick up Bird (2007b) suggestion to solve this problem, by performing an holistic side-step; one has to abandon the claim that a property's identity is fixed by its manifestation (thus abandon (4)-(4') as criterial identity conditions), and rather adopt the claim that all facts of numerical identity and distinctness are decided by the structure built on powers from the manifestation relation M.

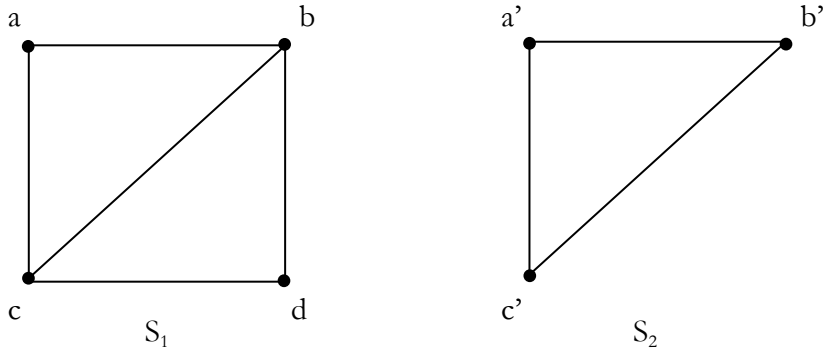
> "The identity and distinctness of the elements of a set *e* of entities supervene on the instantiations of some relation R (or set of relations $\{R_i\}$) on the elements of *e*. […] Could a set of R-relations on *e* suffice to determine the identities of each element of *e*? The answer is 'Yes'. As Randall Dipert argues, this is just a simple question in graph theory."[87]

Bird urges us to consider asymmetric structures with no non-trivial automorphisms, viz., with no other structure-preserving map unto themselves other than identity. But why exactly would such structures determine the identity and distinctness of its entities? Ralf Busse has shown[88] that asymmetric structures, but not symmetric ones, are sufficient to determine the exact cardinality of a set of objects that can satisfy it. Consider the following symmetric structures S_1 and S_2.[89]

[87] Bird (2007b: 527). Here Bird is referring to Dipert (1997).

[88] Busse (MS).

[89] In the following, I will consider for simplicity only undirected graphs, even if the directionality relation under consideration is most certainly asymmetric.



Now consider the injection from S_1 to S_2 that maps *a* and *d* to *a'*, *b* to *b'*, and *c* to *c'*. It is a structure-preserving map, but not a bijection. Thus the relational pattern that is common to S_1 and S_2 can be exemplified by either three or four elements. The same cannot happen for asymmetric patterns (Busse convincingly offers both a *reductio* argument and a more detailed proof). Is this holistic move sufficient to solve the difficulty? Two difficulties block this conclusion.

The first reason, noted by Busse himself, is that cardinality facts are entailed or modally constrained by asymmetric relational patterns –but this is not sufficient to conclude that the former are grounded or "fixed" in any metaphysically significant sense, by the former. This is a very similar objection to the one I raised against Lowe's arguments for the sameness of identity$^{=}$ and individuality fixing: neither modal supervenience or covariance, nor entailment or inference, can be simply equated to metaphysical determination.

Secondly, even conceding that an asymmetric relational pattern grounds the cardinality of the set of elements exemplifying it, that would still fall short of the needed conclusion: namely, the claim that a mathematical structure (or, more abstractly, the relational pattern shared by both S_1 and S_2) grounds identity$^{=}$ and distinctness$^{=}$ facts amongst its element. How could we bridge the gap? Assuming grounding to be transitive, we could achieve the goal by proving that cardinality facts ground identity$^{=}$ and distinctness$^{=}$ facts; yet, even considering identity$^{=}$ and distinctness$^{=}$ facts to be closely correlated to one-ness and two-ness facts (as above), there is hardly any reason to believe that is the case. (E.g., take three friends Jane, Martha, and Sarah. Jane and Martha are two, and Sarah is one. Jane, Martha and Sarah are three. Why would we think that the former two facts are grounded in the latter?) On the face of it, the gap between grounding the cardinality of a set and grounding identities$^{=}$ and distinctness$^{=}$ between its elements, is a massive one to bridge. Thus, it is in unclear whether Busse's claim that asymmetric structure are sufficient to settle cardinality facts, is sufficient to make Bird's holistic move a satisfactory answer to IRA –understood as a regress of identities$^{=}$.

In short, there is a significant amount of evidence to the conclusion that Bird's holistic move cannot be a way to fix facts of numerical identity and distinctness, viz., facts of one-ness and two-ness about powers; without such a move available, one has to move back to criterial identity conditions like (4)-(4'), and the regress argument kicks back in full force.

It is however a viable fall-back solution to this first version of IRA to simply embrace (4)-(4') while rejecting monism; at some point, non-powers break the regress or circularity in the fixing of identities$^{=}$. Albeit this might not be an unacceptable cost, that would make for an unappealing ontological primacy of non-powers over powers, at least when it comes to their identity$^{=}$.

5.2 A regress of individuation

The settling of identities$^{=}$ between powers, or the settling of cardinality facts about them, was hardly was Bird had in mind when proposing his structural move against IRA; presumably, he was concerned with the issue of individuation.[90]

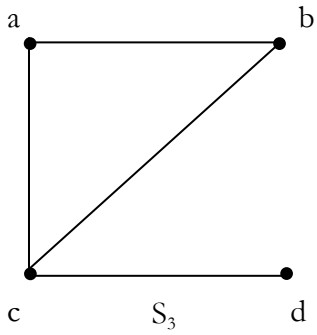
Is there a version of IRA that concerns metaphysical individuation? It would seem so. If every power gets its individuality fixed by another power (its manifestation), then it would seem that the quest of individuators either generates an infinite regress or a circularity. The worry is that if, say, power *a* is individuated by *b*, and *b* by *c*, and *c*, in turn, by *a*, that would be very problematic: for how could *a* be the power it is, rather than another, if that was ultimately to rest upon *a* itself? Lowe (2010: 21) seemed to think that something along those lines could be problematic.

> "Two different entities of the same kind cannot both individuate *each other* any more than –to use the memorable analogy exploited by Russell– two people can make a living by taking in each other's washing. […] Consider first the two-entity case. Two distinct Ks cannot *each* determine *which* K the other one is, because unless it is *already* determined which K one of them is, this K cannot fix the identity of the other. And the two-entity case surely generalizes."

The key point here is the generalization from a two-entities loop, viz. a symmetry; this generalization however works, and generate a problematic circularity, only if metaphysical individuation has the right formal properties (e.g., transitivity and asymmetry); this may be argued for by claiming that, as a relation of metaphysical determination or "fixing" (in which something fixes something else's individuality), metaphysical individuation is a strict partial order. This may be the case if metaphysical individuation, as a relation between two entities, inherits the formal properties of the grounding relation involved in (2) questions and relative answers –for instance, if we posit that, for ever x and y, x metaphysical individuates y if and only if y being an individual is grounded in a further fact involving x. I will skip details; and unfortunately for us, Lowe does not elaborate the claim that the two-entity case *surely* generalizes. I will however take the presence of an individuation loop to be a *prima facie* concern, that constitutes a real threat for the supporter of PP+monism. This is the second version of IRA.

In this context, Bird's suggestion works as follows: one has to abandon the claim that a power is individuated immediately by its manifestation, by what it is a power to do. Rather, it is individuated by its position in an asymmetric structure generated by the manifestation relation. In an asymmetric structure (in the sense defined above) every item occupies a *unique* position –which can be easily characterized in terms of the relation itself; but not in a symmetric structure. E.g., in S_1, *a* and *d* have the same relational characterization: for they are both related to both *b* and *c*; on the contrary, in the following asymmetric structure S_3 every item has a unique relational characterization.

[90] Since this is not an exegetical work, I am not primarily concerned with what Bird had in mind –which version of IRA he was explicitly trying to repel. I am more interested in a broader application of his strategy. Nonetheless one may get the feeling that, in the passage quoted above, Bird is using the term "identity" ambiguously. In the first occurrence "identities and distinctness of the elements…", he may be taken to be talking about identity$^{=}$ and distinctness$^{=}$; whenever the term "identity" is accompanied by "distinctness", one immediately thinks of numerical identity, since there is no clear sense of "non-identity" or "distinctness" to be associated with identity *qua* individuation or essence. Yet in the second occurrence "the identities of each element…", he seems to be talking about individuation –as the rest of the paper makes somewhat clearer.



S_3's relational pattern may be sufficient to individuate all its elements, since the relation is instantiated in unique ways by each of them. Consider a world whose dispositional structure is the one like in S_3, in which *d* is a power to *c*, *c* is a power to *a*, and *b* is a power to *c*. According to the original claim, *c* is individuated by being a power to *a*, which in turn is individuated by being a power to *b*, which in turn is individuated by being a power to *c*. Hence the regress. However, we can notice that *c* is the manifestation of both *b* and *d* –more importantly, the only thing to enjoy this status in the structure. In other words, *c* is the only thing in the structure to which the predicate "M(x,a) & M(b,x) & M(d,x)" truthfully applies. This should individuate it.

However, as noted in Busse (MS), things are slightly more complicated than that. Remember what is an individuator for x: something that provides necessary and sufficient condition for being x, e.g., something that fixes TW-identity matters for x. An asymmetric structure can decide the exact number of its member, and can assign to each a unique position; however, it isn't sufficient for the claim that if power x occupies the unique position P in the structure, that is necessary and sufficient for being x, viz., it isn't sufficient for the claim that whatever power occupies P in every possible structure, then that power is x.[91] This can of course be imposed as a brute fact –that there are no two isomorphic power structures. It wouldn't be, mind you, a completely *ad hoc* solution, as it seems to be in line with PP's anti-quidditist flavor: for it would imply that no two powers can occupy the same role in an asymmetric structure of powers: viz., have the same manifestations and be the same manifestations, for that would fail to constitute a genuine difference in the world. After all, Bird's interest was mostly likely sparked by Dipert's emphasis on structural individuation and his disregard of labeled graphs –a conception too close, in his mind, to the suspicious metaphysical tradition of what he called "*deus ex machina* individuation" (Dipert 1997: 345). This, in turn, closely resembles the haecceitist/quidditist procedure of merely stipulating identities (this is also why Dipert prefers to avoid set-theoretical definitions of graphs, which would require a pre-existing set of vertices, each with their own identity).

Thus, for PP, there is some ground to the claim that the unique position in the structure individuates powers, and it may be a good way to avoid a regress in individuation procedures; this is however a very substantial metaphysical claim, and not one that can be justified merely by observing the properties of mathematical structures. Surely it is not a "simple question in graph theory" as claimed by Bird. That being said, this could be viable position for the supporter of PP who doesn't want to give up on monism.

However, Lowe (2010) offers two arguments against it. First of all, one simply has to notice that the account needs asymmetric structures to work; if the position in an asymmetric structure is what individuates a power, not only the world displays an asymmetric power structure, but also every world in which there are powers does. If sameness of position is an applicable TW-identity condition for powers, it must also be an applicable intra-world identity condition as well; thus, again, applicable at all worlds in which there are powers. But this commits one to a suspiciously strong claim, viz. that non-

[91] As Busse notes, it is not even sufficient for the weaker claim that P is necessary of x –viz., that x necessarily occupies the same position in the power structure at all worlds.

trivial automorphisms in power structures are (metaphysically?) impossible. There are several ways for this claim to be problematic. First of all, one could claim that the philosopher cannot establish it *a priori*; not because it might be discovered *a posteriori* that asymmetric structures are not impossible (how could that be?), but because it could be discovered *a posteriori* that they actually exist. The conclusion is that this position about the individuation of powers opens up to an empiric or scientific refutation. Lowe (2010: 18) argument is furthermore that "it simply isn't credible" that symmetric power structures are metaphysically impossible, and surely not something that the supporter of PP+monism can simply declare in order to solve the individuation version of IRA. None of these points constitutes, in my opinion, conclusive arguments, yet they need to be addressed. The supporter of PP may of course be worried that her position is open to *a posteriori* refutation, but then again, she might very well take pride in that (until the refutation takes place, as it is). As for the second point, it is in my opinion not sufficient to claim that the impossibility of asymmetric structures is "not credible" to completely discard Bird's solution –yet it is, of course, a cost of the position that one will need to keep in mind, and eventually evaluated amongst other costs and benefits.

The second argument against this brand of PP is proposed in Lowe (2010: 23-24); it does not engage with metaphysical individuation proper, but with our ability to individuate powers. If powers were to be metaphysically individuated by their unique position in an asymmetric structure, the only way for us to know which powers there are would require us to know the structure that is actually exemplified in the world. But this is a needlessly strong requirement –and one that possibly commits us to some radical ignorance about which properties there are. Considering that the chief justification for PP are the epistemological advantages gained over quidditism, this would be a huge setback for this particular version of the account. Lowe was of the opinion that the only way out of IRA, presumably understood as a regress about individuation, was to abandon monism –and accept that, down the line some power is individuated by a non-power. This is, once again, a way out that the supporter of PP should always be aware of.

5.3 A regress of natures

Insofar, I have discussed IRA as an argument from the regress of identities[=] and individualities. All in all, the argument has various degrees of success; Bird's holistic move is not, in neither case, the saving grace he probably would have hoped it to be, and the acceptance of non-powers to avoid looped or infinite structures seems to overall be a good exit strategy. Nonetheless, there is a metaphysically deeper worry in Lowe's formulation of IRA that we still haven't discussed, which, ultimately, will pose a far greater danger to PP than any other version of it; in this case, the rejection of monism will no longer be an acceptable way out.

We have seen by her answers to questions (2) and (3) that the supporter of PP takes powers to have manifestations as a matter of essence; furthermore, for each power, having such-and-such manifestation counts as an individual essence of that power. But as we have also seen, we shouldn't take (individual) essences to be distinct entities from which they are essences of. Thus, if dispositional directionality (as introduced in Chapter 6) is the special ingredient of R-powers as an essential or constitutive feature of powers –then we shouldn't understand directionality as something distinct from the power itself; being a power to… is not, therefore, an essential property or relation that the power instantiates; it is, rather, what the power itself is (Marmodoro: 2010). As in Molnar (2003: 60):

> "Directedness is an essential feature of power properties […]. Having a direction to a particular manifestation is constitutive of the power property."

Furthermore, according to PP, powers are exhausted by directionality; they are, so to speak, nothing but a direction to a manifestation. For the supporter of PP thinks of properties, as in Armstrong (1997: 69),

> "as having a nature that essentially looks beyond the particulars they qualify, outward to potential interactions with further particulars, and where this nature is exhausted by these potential interactions."

This essential "directionality", "directedness", or "pointing beyond themselves", is admittedly, a rather mysterious feature of powers. In Chapter 6 I have argued that friends of powers, under some metaphysical assumptions, may take dispositional directionality to be a genuinely relational element of dispositionality. After all, in formalizing directionality in (4)-(4'), I used the relational predicate M to stand for a manifestation relation "…is the manifestation of…", or, conversely, "…is a power for…". That there is an exhaustive relational element in the essence of powers is something that supporters of PP have hinted for a long time.[92] For example, Bird writes that:

> "For the dispositional monist, the essences and hence the identities of entities are to be determined *relationally* rather than purely intrinsically (as is the case for categorical properties)."

Because he takes manifestations to be properties, this leads him, as a supporter of PP, to the conclusion that:

> "Dispositional monism is the view that all there is to (the identity of) any property is a matter of its second-order relations to other properties. […] In dispositional monism the second-order relation in question is the relation that holds, in virtue of a property's essence, between that property and its manifestation property, which I shall call the *manifestation relation*."[93]

In order to proceed, we have to be exactly clear what PP amounts to; in fact, Bird's formulation (as noted in Ingthorsson 2015) is ambiguous in one important respect. One the one hand Bird seems to be claiming that powers are (nothing but) second-order relations; but on the other, he seems to be claiming that second-order relations obtain in virtue of powers and their nature. These two claims are hardly compatible, under the assumption that the "in virtue of" relation is irreflexive. By claiming that second-order directionality obtains in virtue of a property's essence, Bird may be shying away from his own previous claim that there is nothing but relations in powers. Similarly, it may be ambiguous to claim (as in the previous passage) that all that there is to a dispositional property "is a matter of its second-order relations" –the crucial part being the "its", which seems to assume that these second-order relations are in fact distinct from the powers that they have as *relata*. Bird seems, at times, to be drawn to both interpretation of PP. That properties are exhausted, and nothing but their dispositionality is clearly hinted by him in other occasions, e.g., Bird (2007a: 72): "not only are the powers of a property essential to that property, they are the essence of the property –they constitute

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[92] Whether PP can be theoretically detached from this relational understanding of dispositionality as directionality-to-a-manifestation, involves a fine-tuned investigation of the position that will have to wait for another time. As of now, I merely present PP as it is defended by its supporters.

[93] Bird (2007b: 527). Similarly, Mumford (2006: 481-483) claims that "to be a disposition is just to be directed towards some possible manifestation".

what it is to be that property". Furthermore, Jacobs (2011), who claims to have discussed these issues with Bird himself, claims that

> "[w]hen Bird says that, "the identity of any property is determined by its relations to other properties," the identity is *not* distinct from the relations. The determination talk can, *without loss of meaning*, simply be dropped; the view is that properties are identical with the relations into which they enter."

Unfortunately, Bird also repeatedly points out that the *other* interpretation is the right one: a power is not a relation, and the directionality relations are second-order, in the sense that they obtain between monadic properties of objects. For example:

> "John Heil […] argues that because powers are intrinsic to their possessors, and because Dipert's world is purely relational, there cannot be a world of pure powers. But this is to confuse the first-order and the second-order cases. The pure powers view does not imply that all first-order properties are relational; i.e., it could consistently reject Dipert's view at the first-order level. Rather, it asserts that the second-order analogue of Dipert's view is correct – powers may have relational essences but none the less be intrinsic to their possessors."[94]

Unfortunately, this second non-relational interpretation is hardly compatible with PP. For if there is something more to a power than the directionality relations, something they obtain in virtue of, then PP, as a doctrine of pure powers, is compromised. If dispositionality (viz. dispositional directionality) is a second-order relation that obtains in virtue of something else entirely, viz. the nature of a first-order property, the strategy of using dispositionality to avoid quiddities and other source of identity for properties would be inapplicable. For PP is exactly the claim that there isn't "anything more" to properties than their dispositionality.

However, if we revert to the first interpretation of Bird's brand of PP, one in which there is nothing more to a property than the directionality relations it enters into, a regress of natures ensues –once we accept monism as well (I borrow the term "nature regress" from Ingthorsson 2015, which explicitly recognized and discussed this radical version of IRA). Let us see how. If all a power is, is a directed relation towards its manifestation –and if all manifestations are in turn powers– we get another regress or circularity. Under the assumption that properties, viz. powers, are infinite in number, there is going to be an infinite regress of directionality relations; that is to say, directionality relations will have as *relata* other instances of directionality relations, endlessly: a "relations all the way down" kind of ontology. Under the assumption that properties or powers are finite in number, at some point the directionality structure is bound to loop back to itself.

What these two situations have in common, is that given that all instances of the directionality relation require *relata*, but all *relata* turn out to be further instances of the relation itself, there would be nothing to ultimately provide "ontic content" or "being" to powers. Every power is a "direction toward something outside" (Molnar 2003: 63) but there is no property outside that is not, in turn, a direction. More generally, the nature version of IRA rests on the idea that we need to find some ultimate *relata* of these nested directionality relations to provide being to all of them; however, the quest never ends. As I hinted in the beginning of the Chapter, I take many other versions of regress arguments against PP, according to which a world of pure powers would be "too fugitive", or "ontologically *manque*" (Molnar

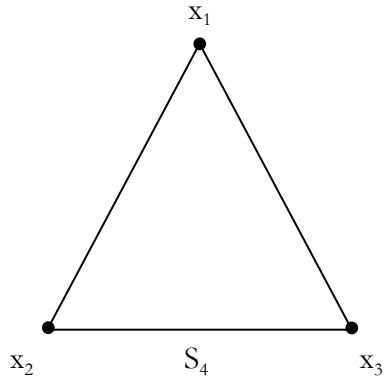
[94] Bird (2007b: 528-529); Bird is quoting Heil (2003: 115). More on this shortly.

2003: 176), in the sense of lacking being, or reality, as very close to this version of IRA.[95] The overall idea of these arguments is that if pure powers get their reality from their (relation with their) manifestations, and if all manifestations are in turn pure powers, then there is no reality to be given; for, as Leibniz wrote, "where there is no reality that is not borrowed, there will never be any reality, since it must belong ultimately to some subject".[96] Similarly, no nature of anything is never decided, since everything is but a direction to some other direction. Ingthorsson (2015: 533) summarizes this difficulty by claiming that:

> "[t]he regress of pure powers […] really boils down to the worry that if powers only have a nature by association to something else, and if all properties are powers, then everything has a nature only by association to something else, which in turn means that everything wants a nature but nothing provides a nature."

Can one escape this situation by employing Bird's holistic move? I can hardly see how. As we already determined, an asymmetric structure is sufficient to assign an unique role to each of its object, but is insufficient for purposes of metaphysical individuation –this at least suggests that asymmetric structures are not *per se* capable to assign (individuating) essences to the objects exemplifying it; it is however possible, again, to simply dictate that the unique position a pure power has in an asymmetric directionality structure is indeed essential to it. But I am not sure I understand what this means. Again, is the property monadic or not? If it is, how can its nature be relational –how can it be exhausted by a relation, or by a "position in a structure"? I will shortly come back on this.

Furthermore, a far deeper revision of our background metaphysics is needed for PP to work out. This is the real problem behind IRA as a nature regress –and one that cannot be easily solved by the rejection of monism. Consider, as a way of example, the symmetric structure S_4, where three powers x_1, x_2, and x_3 are related by the directionality relation: x_1 is a power to x_2, x_2 is a power to x_3, and x_3 is a power to x_1.



According to Bird, S_4 is a structure with three instances of the second-order directionality relation obtaining between pure powers x_1, x_2, and x_3; but given the aforementioned characterization of PP, this isn't quite right, as there is nothing more to the pure powers than the directionality relations they enter into. But who is "they" –given that pure powers are exhausted by the relations (viz., the edges of S_4)? What exactly are x_1, x_2, and x_3? And how can the M relations be second-order (viz., obtaining between properties?). Of course the simplest idea would be to identify x_1, x_2, and x_3 with pure powers, as distinct from the M relations they exemplify –and yet, as we have seen, this is not an option for the supporter

[95] Again, for these arguments, see Campbell (1976: 93), Robinson (1982: 114-115), and Heil (2003: 98-108).

[96] As reported in Adams (1994: 335).

of PP. Quite straightforwardly, this means that what we took to be monadic properties (dispositional properties of objects such as *fragility*, or *irascibility*), are after all relations, which would already be an high price to pay. Following Jacobs (2011) we can put this argument in the form of a dilemma for PP, and ask: if pure powers are the M relations (viz., the edges of the S_4 graph), then what exactly are x_1, x_2, and x_3? And how do objects come into the picture, if all dispositional properties are actually relations? The possibilities are the following:

a) The simplest solution would be, once again, to abandon monism, and claim that x_1, x_2, and x_3 are non-dispositional monadic properties possessed by objects. Therefore, dispositions are ultimately high-order relations obtaining between properties. At this point one could legitimately wonder why I am still calling them "powers" –for they are closer to Armstrongian laws than anything else; they are not properties of objects, and they do not seem to be causally efficacious (the properties are). Thus, in this case abandoning monism doesn't seem to be viable option for the supporter of PP.

b) Alternatively, x_1, x_2, and x_3 are objects. Thus S_4 is a first-order structure between objects. But this isn't quite right: for S_4 was introduced as a structure of properties, but we are now told to take it as a structure between objects. In general, there is no guarantee that a structure of properties is isomorphic with a structure of objects. Of course there could be ways to make this work; for example, we could take dispositional properties to be extremely fine-grained relations obtaining between ordered n-tuples of possible dispositional partners. But this is still a picture in which no monadic properties ever exist, or, if they exist, they are not represented in the S_4 structure.

c) x_1, x_2, and x_3 are further dispositional relations –thus resulting again in a "structure all the way down" kind of situation; or perhaps there are no x_1, x_2, and x_3 and we must accept *ante rem* structure with empty places. Perhaps, according to the latest interpretation of Bird's holistic move, x_1, x_2, and x_3, as empty places or positions in the *ante rem* structure, are all that there is to powers. But this is again very mysterious, since powers are supposed to be first-order, intrinsic, presumably monadic properties of objects; in this picture, if anything at all, objects could ultimately be sub-regions in the structures. This is the most revisionary of all pictures, and one that brings PP closer to certain versions of ontic structural realism.

d) Finally, one way to avoid this tangle about S_4 is to reject the radical interpretation of Bird's PP according to which there is nothing more to dispositional properties than their second-order relations. So x_1, x_2, and x_3, are powers after all. As we have seen, this is an interpretation that Bird himself has flirted with. But it still has to qualify as a *pure* powers view: such monadic properties have no intrinsic nature or identity beyond what is assigned to it by the relations, or the structure, and is therefore derivative upon such things. This is again a very radical picture, and one that needs to answer many questions; e.g. how can pure powers be something more than the relations, if they have no independent nature beyond them –and similarly for the structure? Furthermore, one will most likely need an *ante rem* structure again to make this work; for, otherwise, how could the relations (and the structure) be identified and articulated without any reference to their *relata*?

Options (a)-(d) are clearly not for the faint of heart –surely, not for anyone who still holds in any account a somewhat "manifest" view of the world consisting in material objects possessing monadic properties. Heil (2003: 98), a renowned opponent of PP, wrote that

> "[i]f an object's qualities are reduced to or replaced by pure powers, anything resembling substantial nature fades away. […] Far from considering this a problem to be overcome, proponents of the thesis that properties are pure powers are more likely to regard the demise of the traditional substance–property ontology as liberating."

PP is, to be sure, not the only position in power ontology in which objects take a backseat; another example is constituted by those dispositionalists who struggled to find proper bearers for the powers responsible to "global" conservation and symmetry principles, an issue Bird (2007a: 213) faced without, on the face of it, much optimism.

However, for many supporters of regress arguments, a world devoid of intrinsic natures, a world where every property, and perhaps every object as well, is exhausted by "pure powers relations", is no world at all –or, if anything, is an empty world, e.g. Campbell (1976: 93). In a way, this is less of an argument and more of a way to reiterate one's allegiance to object-first metaphysics; thus, Heil's prescription of PP as the cornerstone of a revolution in metaphysics may sound unappealing to those with more conservative tastes (Heil included); for PP configures not just as a theory about the internal make-up of dispositional properties, but as "a new theory of everything". It is a cost of PP, as opposed to its alternatives, that it only works under such radical assumptions about the make-up of reality.

6. Conclusions

There are many reasons to embrace the pure powers view as a rejection of quiddities. However, Lowe (2006: 138) has claimed that, when the pure powers view is paired with dispositional monism, viz., the claim that all properties are powers, an identity regress argument ensues: for every pure power requires a pure power to get its identity fixed. By disambiguating at least three important senses of the notion of *identity*, and the *fixing* thereof, I have discussed Bird (2007a, 2007b) holistic side-stepping strategy to the argument, according to which a pure power's position in an asymmetric structure is all that one needs to fix its identity; overall, I have found this strategy to be sorely lacking in all possible interpretations of IRA; all in all, rejecting the monist assumption seems like a good way out for the friend of pure powers, so as to have a non-power to ultimately break the regress, or avoid the circularity.

Unfortunately, the strongest version of the identity regress argument cannot be dealt with in this fashion, and betrays just how metaphysically revolutionary the pure power doctrine really is. The more rigorous (and conservative) reader may have found the last section to be quite elusive and obscure. She wouldn't be wrong. Yet this exactly is the kind of discussion to which we are forced to when we embrace PP. In order to make sense of the idea that dispositional properties are exhausted by their dispositionality, one needs to shift its metaphysical focus in a strongly structuralist direction, and perhaps reject object-first metaphysics as well.

I will now discuss an alternative to the Pure Powers view, viz. the Powerful Qualities view, which avoids these troublesome consequences.

CHAPTER EIGHT
POWERFUL QUALITIES

7. Introduction

Our discussion on the identity regress arguments against the Pure Powers view (PP) concluded with the claim that a world of pure powers is most likely at odds with the ordinary worldview introduced in the beginning of the thesis (viz., a world of objects instantiating intrinsic, monadic properties). The Powerful Qualities view (for brevity, PQ), is supposedly less revolutionary; as it allows for categorical properties, viz. the conception of properties "in which many of us were brought up" (Armstrong 2005: 312). That being said, PQ presents some radical elements on its own, as that it claims that properties are both dispositional and categorical (or *qualitative* –more on qualitativity shortly). This is usually formulated as a form of monism –in the sense that all properties are both dispositional and categorical. The position was originally developed through the work of Charles Martin and John Heil.[97] PQ has, since its inception, failed to command belief across the board. Yet, while it is hard to find philosophers explicitly defending PP, PQ has its fair share of staunch supporters, which I will call "PQers"; most notably, Strawson (2008), Schroer (2010, 2013), Engelhardt (2010), Jacobs (2011), Ingthorsson (2013) and Taylor (2013).

PQ may immediately strike one as a peculiar position, and a possibly obscure one. Remember the different positions about powers introduced in Chapter 4. A PQer would agree with the Categoricalist that all properties are categorical, yet she will immediately qualify her claim by saying that they are also dispositional –a claim the Categoricalist will reject or find incredible. Similarly, a PQer would agree with a supporter of PP (for brevity, "PPer") that all properties are dispositional –yet she will also claim that they are also categorical, a claim this adversary will find equally puzzling. PQ therefore occupies a peculiar middle ground between power ontologies; whether or not one accepts it, it is a very interesting test drive for many conceptions of dispositionality –as we will see in the last two Chapters of this thesis.

In this Chapter, specifically, I will try to dispel the potential obscurity surrounding PQ, and articulate it into a coherent power ontology. This will however involve reconsidering some of the claims occasionally offered by its supporters. First of all, I will present the position as it is commonly defended, in section 2. In section 3 and 4, after drawing an important distinction in the notion of the "identity between the categorical and the dispositional", I will highlight the status of PQ as a metaphysically substantial position, in contraposition to its older cousin NM (Neutral Monism, see Chapter 4). In section 5 and 6, I will discuss the nature of categoricity and dispositionality according to PQ, in order to understand how exactly it is possibly for any property to be both (and, of course, to understand how having powerful qualities instead of pure powers can solve the various regress arguments against PP). The PQers' usual characterization of categoricity, as we will see, run the risk of being "quasi-trivial", in the sense that they do not offer a metaphysically substantial characterization of categoricity to distinguish PQ from its PP adversary. This is the topic of section 7.

Ultimately, I think that there is a stable and metaphysically substantial position in which properties are both categorical and dispositional –once it is properly understood what it is for a powerful quality to be powerful, and what it is for it to be a quality. However, it requires some extent of manipulation of the claims often put forward by PQers. Whether this slightly corrected position is one all PQers would accept, remains to be seen.

[97] Martin (1993, 1997, 2008), Heil (2003, 2005, 2010), and Martin and Heil (1999).

8. Presentation of the view

2.1 Powerful qualities

No better way to present PQ than to read about it from its proponents; Martin (1997: 216):

> "For any property that is intrinsic and irreducible, what is qualitative and what is dispositional are one and the same property viewed as what that property exhibits of its nature and what that property is directive and selective for as its manifestations. These cannot be prised apart into the purely qualitative and the purely dispositional […] There is no direction of priority or dependence. There is no reduction of one to the other. The only way that this can be expressed is by claiming that the qualitative and dispositional are identical with one another and with the unitary intrinsic property itself. This is perhaps a surprising identity, but frequently it happens that different representations turn out to one's surprise to be of the identical entity."

An extremely succinct presentation of the view is also offered in Heil (2003: 111):

> "If P is an intrinsic property of a concrete object, P is simultaneously dispositional and qualitative; P's dispositionality and qualitativity are not aspects or properties of P; P's dispositionality, P_d, is P's qualitativity, P_q, and each of these is P: $P_d = P_q = P$."

Given these passages, we can summarize PQ in five claims.

1) (All) properties are both dispositional and categorical/qualitative.
2) The dispositional and the categorical are identical; there is no priority direction, no grounding, no supervenience, no reduction between them. They are on an equal footing.
3) This does not involve any internal complexity, any compound or mixed status of the property. Properties are simple.[98]
4) Additionally, dispositionality and categoricity are not second-order properties (properties of the property).
5) Pure dispositionality and categoricity are "unrealizable limits" (Martin 1997: 216) of the property, mere abstractions from its reality that only partially consider it (this does not mean that they consider *parts* of it; they rather consider it, as a whole, in a certain way).

It might not be easy to take these five ideas into a fully fleshed and coherent account. Yet PQ has been taken to have many preliminary virtues that would make it worth the effort. All in all, PQ purportedly alleviates the problems of a world being *only* populated by categorical or dispositional properties, or both of them separately.

First of all, PQ may solve in a very elegant way the epistemological and skeptic worries associated with Categoricalism (as discussed in the previous Chapter) –without giving up the idea that there are categorical properties. The reader will remember that, being our only epistemic access to any property through the causal and nomic roles it plays, and being a categorical property independent from such roles, we will never be able to access its ultimate nature –thus the so-called "quidditistic" or "Ramseyan

[98] Heil (2010: 23ff). Also see Ingthorsson (2013: 70-71); the simplicity of properties presumably also has to do with their being qualities –physical qualities must in some way resemble the phenomenal qualities of experience; and these (such as *this experience of red*) appear to be immediate simple entities. As introduced in Chapter 2, many PQers, most notably Martin and Heil, believe in particularized properties as immediate objects of perceptions.

humility" (Lewis 2009) of the Categoricalist. A premise of this reasoning is that the property enters causal/nomic roles contingently, a premise Categoricalists such as Armstrong and Lewis accept; even denying this contingency, one would be left to explain the ensuing necessary correlation between the property and its roles (Tugby 2014: 3-4). The PQer is in a better position. A categorical property, being identical to a disposition, enters such roles necessarily; the necessary correlation between properties and their observable behavior is ensured through the identity between the categorical and the dispositional property; and identity is famously the most reputable candidate for the explanation of a metaphysical necessity. Secondly, as it has been argued in Chapters 4 and **7**, a world of pure powers is a world sorely lacking in something categorical –for lack of a more precise term. The regress arguments against PP are, as we have seen, mostly hit and miss, but some of them appear to be posing some degree of genuine danger to the position. Therefore, PQ should able to provide the world with categoricity as well as dispositionality –thus solving any such regress without giving up monism. Thirdly and finally, the need of both categoricity and dispositionality in the world is satisfied here without falling in the trappings of dualism; e.g., the threat of causal overdetermination, or conversely, the existence of causally inert properties.

These are only some of the reasons to explore the PQ alternative. However, some preliminary work needs to be done for it to count as a viable candidate in power ontology.

8.2 The identity between the categorical and the dispositional

Perhaps the most radical element of PQ is the identity between the categorical and the dispositional (2), two notions that were once universally thought to be mutually exclusive.

First of all, one must notice, as in (3), that the claim that properties are both dispositional and categorical must be consistent with properties being simple; properties do not have dispositional and categorical parts, they are not compound nor mixes. This position has been wrongfully associated to PQ from time to time. To be clear, Charles Martin *did* claim, as in Martin (1993: 519), that "any intrinsic property is Janus-faced or a two-sided coin", and this was erroneously associated to a "dual-sided view" of properties, according to which properties are not wholly, but only partly dispositional and categorical; they have dispositional and categorical parts, sides or aspects. However, PQers (Martin included) all express themselves against this idea. Relatedly, as in claim (4), dispositionality and categoricity should not be understood as second-order properties of a property –viz., as different ways for a property to be. A property is not both dispositional and categorical in the same sense in which a ball is both red and round; for, as in Martin (1997: 216): "[the] characterization [of the property as categorical or dispositional] in terms of 'different ways of being' is still too suggestive of a mixture". The contrary opinion would be one according to which, as in Molnar (2003: 149):

> "all properties have something *about them* that is irreducibly and ineliminably dispositional, and something (else) *about them* that is irreducibly and ineliminably non dispositional or 'qualitative'".

But, given (3) this is hardly the situation of powerful qualities. A powerful qualities is *wholly* categorical and *wholly* dispositional; it has no categorical or dispositional parts, and neither it has two distinct sides or aspects (whatever that means) that separately warrant the two ascriptions; on the contrary, a powerful quality is a simple thing, with a simple inseparable nature. As in Heil (2010: 61):

> "A property's dispositionality and its qualitativity are not aspects or properties of the property. Rather they inseparably constitute its nature."

The point of PQ is thus that the categorical and the dispositional are identical, as in (2). Unfortunately, there's an important ambiguity in the notion of an identity between the categorical and the dispositional, which generates some problems in the formulation of PQ. For there are at least two senses in which the categorical and the dispositional can be said to be identical. First of all, they can be identical in the sense that every categorical property is identical to a dispositional property, and vice versa; under the assumption that every property is either categorical or dispositional, this is sufficient to conclude (1) –that (all) properties are both categorical and dispositional. This reading of the categorical/dispositional identity, I will call Weak Identity. A stronger reading of the identity in (2) however claims that, for each property, its categoricity and dispositionality are *themselves* identical (and, in turn, identical to the property itself); this is also sufficient to infer (1). This reading of the identity in (2) I will call Strong Identity; Strong Identity implies Weak Identity, but not vice versa (hence the names).

Both readings are, at times, taken to be the correct formulation of the identity in (2). For Weak Identity, see Martin's quote above, but also Taylor (2013: 94): "[t]he claim of the powerful qualities view is that dispositional and qualitative/categorical properties are identical". For Strong Identity, see Heil's quote above –which states it very clearly–, but also Martin and Heil (1999: 46-47). And again, Martin (1997: 216) claims that dispositional and categorical are not different ways for a property to be –which at least suggests that Weak Identity is indeed too weak to properly capture the identity in (2). And perhaps Strawson (2008: 274-275) also meant something along these lines in claiming that the reality, or being, of a categorical property fully overlaps that of a dispositional one.

There are several reasons to think, at least *prima facie*, that Strong Identity is the way to go. First of all, it implies the weaker reading, thus legitimizing all of the previous PQers claims; the contrary does not hold: as we have seen, many PQers explicitly state that the categorical and dispositional are identical in the sense of Strong Identity; thus, Weak Identity (which does not imply it) is not sufficient.

Additionally, Strong Identity is a natural fit for positions such as (3) and (4). For if you believe that properties are simple, without detachable parts, or aspects, which might warrant the ascriptions of two distinct properties, it comes indeed difficult to believe that categoricity and dispositionality are two distinct ways for properties to be. On the contrary, ascriptions of dispositionality and categoricity to the property are simply true in virtue of the property itself, and not in virtue of any part, or second-order property it possesses. Thus, if categoricity and dispositionality are not different ways for the property to be, all appeal is lost of the claim that they are ways for the property to be *tout court*; it rather comes natural to think that they (or, rather, it) are but the property itself. This is the strongest sense in which we might have an identity between the dispositional and the categorical (Strong Identity) in which the dispositionality and the categoricity of a property are one and the same, and in turn one with the property itself.

In short, there are *prima facie* reasons to understand PQ as claiming that the dispositional and the categorical are identical in the sense that the dispositionality and the categoricity of each property are themselves identical (and, in turn, identical to the property itself).

9. A difference within an identity

Unfortunately, there's an inherent danger for the PQer that accepts Strong Identity, albeit one that is not often recognized. For the PQer takes herself to hold the metaphysically substantial –and even radical– position according to which properties are both categorical and dispositional, and would reject the claim that there's really no metaphysical difference between the two. This last claim needs some

elaboration. PQ of course claims that categoricity and dispositionality are not exclusive metaphysical categories, which allows for the claim that properties are both categorical and dispositional (Weak Identity); furthermore, PQ claims that the two qualifications do not generate any internal complexity in the property, or its nature. That being said, however, categoricity and dispositionality need to be two distinct categories, packing different metaphysical information: perhaps, as PQ maintains, their extensions completely overlap, and perhaps they are possessed by simple entities, yet they must somehow be different qualifications, for the position to have any "metaphysical kick".

What do I mean by "metaphysical kick"? Consider, by way of analogy, the necessarily co-extensional properties of *trilaterality* and *triangularity* when conceived by someone who rejects an hyperintensional account of property individuation. Thus, *trilaterality* and *triangularity* are the same property: being one or the other is the same thing, viz. there is no difference, in reality, between something being trilateral or triangular. Any difference between *trilaterality* and *triangularity* is merely representational. This is however bound to metaphysically deflate any claim like "object *a* is both trilater and triangular"; in the sense that we are not adding anything, metaphysically speaking, by adding "and trilangular"; we are rather adding a new representation of the same object, instantiating the same properties. According to this conception, saying "object *a* is both trilateral and triangular" is analogous to claiming "Tibbles is both a kitten and a kitty"; the conjunction is not doing anything, except, perhaps, adding conceptual nuances.

This is the situation in which PQ finds itself in, once Strong Identity is accepted. Strong Identity, in fact, does not merely claim that, necessarily, every categorical property is dispositional, and vice versa. Weak Identity is sufficient for this claim, once accepted with the strength of metaphysical necessity. It claims that the two are identical; thus, the claim "property *a* is both categorical and dispositional" is metaphysically deflated in the same way in which "object *a* is both trilater and triangulal" is deflated, for one who believes trilaterality and triangularity to be the same property. Namely, whatever the categoricity of a property consists into (more on that later on), the PQer is not adding anything of substance by conferring dispositionality to it as well –only, perhaps, conceptual or otherwise representational nuances.

Of course, the PQer will reply, by way of (4), that we really shouldn't model the case of categoricity and dispositionality through the case of *trilaterality* and *triangularity*: for categoricity and dispositionality are not properties. Yet it is highly unclear how this is supposed to make the situation better. If anything, it appears to me that the situation becomes worst. Given (4), Strong Identity between the categorical and the dispositional (and, in turn, their identity with the property itself) resembles more the identity between Clark Kent and Superman, than the identity between *trilaterality* and *triangularity*. Thus, Heil's (2003: 111) identity chaining "$P_d=P_q=P$" (a property's dispositionality is identical to its categoricity, which is in turn identical to the property itself") becomes analogous to the identity chaining in "Clark Kent is identical to Superman, who is identical to Kal-El"; which does nothing, except introducing new given names for a said individual. Furthermore, given plausible assumptions about the Indiscernibility of Identicals (which I take to be an undisputable principle), whatever feature Clark Kent has, Superman also has; whatever Clark Kent is, Superman also is. And similarly, for the PQer who accepts Strong Identity, whatever feature categoricity has, dispositionality also has; whatever categoricity is, dispositionality also is. Unfortunately, this deflates the claim that properties are both categorical and dispositional, to the point of being redundant. The PQer takes herself to be expressing a metaphysically important claim when she declares that "properties are both categorical and dispositional"; yet, if the identity between the categorical and the dispositional in (2) is understood along the lines of Strong Identity –as some PQers explicitly advocate– she really isn't. Thus, the PQer finds herself in a unusually difficult position, for she has to posit a "difference within an identity" between the categorical and the

dispositional; yet if categoricity and dispositionaltiy are identical, and furthermore, identical to the property, claiming that the property is categorical, rather than dispositional, is of little to no metaphysical import.

Although this difficulty concerning the identity in (2) has been seldom explicitly discussed, the worry has always loomed over PQ that the two categories of categoricity and dispositionality (and thus, their difference) might end up having little to no metaphysical weight –but merely be a matter of description, conceptualization, of representation. This is a worry that one must disperse, if the discussion around PQ wants to proceed.

3.1 PQ and NM

First of all, insofar as there is no real difference in a property being categorical, and a property being dispositional, one may perceive an air of vacuity in saying that it is both. To have perceived this air of vacuity was perhaps Inghthorsson (2013: 56) when he wrote that, according to PQ:

> "there really are no pure qualities and/or pure powers; properties either are both qualities and powers, or neither […]. The difference between 'both' or 'neither' is negligible."

If dispositionality and qualitativity are not mutually exclusive (as traditionally thought) and in fact generate no ontological difference in what they qualify, then the two qualifications are not, so to speak, fighting this impossible fight inside the property, and they may eventually collapse into a metaphysically more neutral view. The reader will perhaps remember from Chapter 4 that the claim that properties are, *per se*, neither dispositional nor categorical, is the signature claim of NM (viz., Neutral Monism).

PQ and NM are occasionally clumped together in the literature (Ingthosson 2013, for one, does it –but he is far from being the only one); and yet the PQer should be wary of this association. There are at least two ways to distinguish PQ from NM. First of all, according to NM, the dispositional/categorical divide is but a divide between predicates and ascriptions; loosely speaking, there are no dispositional properties –just dispositional predicates; and the same goes for the categorical. On the contrary, PQ claims, as in (4), that dispositionality and categoricity are not second-order properties, they are not features ascribed to the property, they are rather identical to the property itself. By the explicit identification of dispositionality (and categoricity) with the property, PQ seems to suggest something very different –and metaphysically less neutral– than NM. Technically NM falls outside of the power realist camp, for it rejects the claim that there are R-powers. PQ, however, endorses this claim.

Secondly (but relatedly), we can distinguish PQ from NM by observing the kind of identity they posit. For NM too, is an identity theory. However, it is so in an importantly different way. This generates an important wedge between PQ and NM that completely stops the collapse of one unto the other. In order to see this point clearly, we must understand how exactly NM is an identity theory. NM is usually paired with the thesis that each power is identical to its categorical base. The difference between NM and with certain versions of Categoricalism, which also provide an identity between a power and its categorical base, is that the identity between the dispositional and the categorical does not present any asymmetry that gives one side the upper hand over the other; thus its neutrality. Mumford (1998: 190-191) calls NM "monism without reductionism". Remember, however, that, according to NM, properly speaking, there are dispositional and categorical predicates, but not properties; therefore, for NM, to claim that dispositions are identical to their categorical bases reduces to the claim that dispositional predicates and categorical ones co-refer. Mumford (1998: 190) summarizes the relation between the dispositional and the categorical by claiming

> "what we have are two different ways of denoting the same properties. […] the dispositional and the categorical are correctly understood just as two modes of presentation of the same instantiated properties."

In Chapter 3 I have introduced the notion of an M-power, viz., whatever property that one refers to through a dispositional predicate. I now introduce the notion of an M-quality, viz., whatever property that one refers to with categorical or qualitative predicate. The identity postulated in NM is therefore an identity between M-powers and M-qualities, viz., it is the claim that dispositional and categorical predicates co-refer. This identity is what I will call M-Identity.

Yet an M-Identity is notably *not* the identity that the PQer has in mind. According to PQ, there genuinely are dispositional properties. As a corollary, as in (1), every dispositional property is identical to a categorical one. I already introduced, in Chapter 3, the notion of an R-power, a property bearing a genuine mark of the dispositional (whatever that is); I now introduce the notion of an R-quality, a property bearing a genuine mark of the categorical (whatever that is). PQ is an identity theory, as in (1) given that identifies R-powers to R-qualities. I will call this kind of identity, R-Identity. We can take M-Identity and R-Identity as two variants of Weak Identity; viz., two ways to articulate the idea that dispositional properties and categorical properties are identical.

Thus, the difference between NM and PQ, *qua* identity theories, lies in the difference between M-Identity and R-Identity. The difference between these two kinds of identity has not been completely neglected in the literature. One must however pay some degree of attention. One way to notice this difference, is to notice the apparently ambivalent attitude of David Armstrong with regard to the identity between the categorical and the dispositional. For, in numerous occasions, Armstrong explicitly submitted that dispositions needed to be identified with categorical properties –in order for them to be causally relevant.[99] However, when he was later faced with PQ, the notion of powers being identical to qualities struck him as almost unintelligible. In Armstrong (2005: 315), he admitted:

> "I confess that I find [PQ] totally incredible. If anything is a category mistake, it is a category mistake to identify a quality - a categorical property - and a power, essentially something that points to a certain effect. They are just different, that's all. An identity here seems like identifying a raven with a writing desk."

It seems therefore peculiar, as in noted in Mumford (2007: 91) that, at some point, Armstrong found the identity between the dispositional and the categorical to be a viable position (indeed, one he would subscribe to), while –at some other point– it struck him as "totally incredible".

However, there are reasons to think that the identities Armstrong accepted were M-Identities, whereas the identities he rejected were R-Identities (whether or not Armstrong actually recognized this difference is beyond the question). The identities Armstrong accepted were merely a matter of *some* property being picked by two different predicates in two different ways, as he suggests in the following passage from Armstrong, Martin and Place (1996: 39, emphasis mine):

> "What then is the disposition, the brittleness? It is the 'categorical base', the microstructure, but it is this property of the object *picked out not* via *its intrinsic nature, but rather* via *its causal role in bringing about the manifestation*. Picked out in this way, it is that standing condition of the glass which, in conjunction with the

[99] Armstrong (1968: 88), Armstrong (1969: 26), and Armstrong, Martin and Place (1996: 39).

initial cause, the striking, plus, perhaps, particular relations of the glass to its environment, brings or tends to bring about the shattering."

Thus, there is *prima facie* reason to think that Armstrong accepted M-Identities; he claims that dispositional and categorical predicates refer to the same properties. However, he would have never accepted R-Identities, viz., identities between a genuinely dispositional property and a categorical property. In the aforementioned passage in which Armstrong criticized PQ, he described dispositional properties through what he took to be the mark of the dispositional; viz. he characterized them as "essentially something that points to a certain effect"; those are clearly R-powers. Then, he clarified that to identify powers –in that sense– with other kinds of properties is simply incredible. In various places, e.g., Armstrong (1997: 69ff) he clarifies that R-powers, properties conceived as the friend of powers conceives them, have no place in his ontology. Armstrong does not identity R-powers with anything else; R-powers simply do not exist. Armstrong is a mere M-realist.

Thus, there are reasons to think that the identity Armstrong is criticizing in PQ is a R-Identity, whereas the identity he accepts (with a direction) is an M-Identity. The supporter of NM can agree with Armstrong that there are M-Identities (they just disagree on whether they are "neutral"); whereas the PQer disagrees with him over the existence of R-Identities.

In conclusion, PQ is not NM. Although both of them are "identity theories", they are so in radically different ways. Thus, I take the claim from Inghthorsson (2013: 56), as fascinating as it is, to be wrong. What's the difference between a property being *both* dispositional and categorical –and *neither*? The answer is surprisingly simple. The second position has no business claiming that there are dispositional properties, nor identifying them with anything else; the first one, however, usually does so.

3.2 Ambiguous drawings

Claim (5) of the characterization above claims, perhaps mysteriously, that categoricity and dispositionality are "unrealizable limits for different ways of being the same unitary property"[100], and that to separate them one would involve an "unrealizable abstraction" (Martin 1993: 519) –albeit perhaps an abstraction that one can entertain in thought. A way to propel this idea forward is that dispositionality and categoricity have to do with how the unitary self-same property is represented. The analogy here is with ambiguous drawings which can be perceived in either one of two different ways (e.g., two-faces/goblet, duck/rabbit, old-lady/young-woman). This lengthy passage from Martin (1997: 216) is worth quoting:

"[T]he qualitative and dispositional are identical with one another and with the unitary intrinsic property itself. This is perhaps a surprising identity, but frequently it happens that different representations turn out to one's surprise to be of the identical entity. […] What is qualitative and what is dispositional for any property is less like a two-sided coin or a Janus-faced figure than it is like an ambiguous drawing. A particular drawing, remaining unitary and unchanged, may be seen and considered one way as a goblet-drawing and differently considered, it is a two-faces-staring-at-one another-drawing. The goblet and the faces are not distinguishable parts or components or even aspects of the drawing, although we can easily consider the one without considering, or even knowing of, the other. The goblet-drawing is identical with the two-faces drawing."

Similarly, Martin and Heil (1999: 46):

[100] Martin (1997: 216), and *verbatim* Martin and Heil (1999: 46-47), and Martin (2008: 64).

> "The inseparability of a property's dispositionality and qualitativity is analogous to the inseparability of the old lady and the young woman in Leeper's famous ambiguous figure."

Using the famous duck-rabbit ambiguous drawing as a paradigmatic example, the point is that there is no real difference, outside of perception, in the drawing being a duck and in the drawing being a rabbit. The duck is the rabbit; there is identity here, not just in the sense that the duck-drawing is the same as the rabbit-drawing, but in the stronger sense that what it is for it to be a duck is the same thing for it to be a rabbit (same lines, in the same positions…). There is no component or part of it that is a duck, and another which is a rabbit; they are one and the same. And even then, there is no part or component of the drawing that is *perceived* as a duck, and another which is *perceived* as a rabbit; the whole, self-same drawing is one time perceived as a duck, and another time as a rabbit.

Out of the analogy, the PQer is now claiming that there is no intrinsic or internal affair of the property that makes it categorical or dispositional; on the contrary, the only difference is relational/representational. Thus the PQer must now accept the claim that dispositionality and categoricity do not engender any genuine, intrinsic difference in the property that bears them –although they can surely be held apart in thought, perhaps through some mental abstraction.[101] An additional virtue of this interpretation of the "difference within the identity" between the dispositional and the categorical is that it allows for them to be mutually exclusive qualifications of a property –they are mutually exclusive ways for the property to be represented, or incompatible mental abstractions (after all, the duck and the rabbit are themselves mutually exclusive ways of seeing the ambiguous drawing; one cannot see the duck and the rabbit at the same time).[102]

The main criticism of this analogy (as in Molnar 2003: 154ff) is that it makes categoricity and dispositionality a completely mind-dependent affair. This is an unacceptable result for the metaphysical realist; for usually, when a power realist claims that there are powers, viz., that there are properties bearing the mark of the dispositional, she is not talking about our representations of reality; she is talking about some aspect of reality that is independent from our representations of it. Yet according to this line of thought, in a world without perceiving entities like humans, it would be false that there are dispositional properties. The analogy between categoricity/dispositionality and trilaterality/triangularity (for those who believe the two latter properties to be identical) is now brought to the exteme: for according to this position, there's no difference in reality between a property being categorical and a property being dispositional, but merely a conceptual or representational difference.

10. Against Strong Identity

Summarizing, the PQer has a problem; for PQ claims that the dispositional is identical to the categorical in the strong sense that a property's dispositionality is identical to its categoricity; a property being both does not generate any complexity inside the property, nor amounts to any real difference. Thus, what is the point in claiming that there are powerful qualities –properties that are both qualitative and dispositional–, if there is no real difference between the two? How can the PQer have her

[101] Strawson (2008). Also, see Gibb (2012) for some details on the Lockean idea of "partial consideration", to which both Martin and Heil were particularly sensible in formulating PQ.

[102] Molnar (2003: 154ff). Although Martin (2008: 68) claims that someone might be able to see simultaneously the duck and the rabbit; and similarly, one might be able to simultaneously consider a powerful quality both as a categorical property and a disposition, thus making the incompatibility between the two completely apparent.

difference within an identity? She should not, as we have seen, resort to NM nor the analogy with ambiguous drawings. Both suggestions work, so to speak, by metaphysically deflating the distinction between the dispositional and the categorical; they are counsels of despair, and do not make justice to PQ as a robustly metaphysical stance about dispositional properties –and not merely dispositional predicates, or dispositional modes of representation.

Unfortunately, it seems to me that without these "deflationist tricks", there's no way to reconstruct this difference within the identity between the categorical and the dispositional. For if the identity is understood along the lines of Strong Identity, then categoricity and dispositionality end up being two names for the very same thing, which merely offer, at best, conceptual or otherwise representational nuances of the properties they name. Yet, as I take it, when the PQer claims that a property is dispositional, she is trying to do something a lot more substantial than that; dispositionality and categoricity, as PQers themselves implicitly recognize, are two very distinct metaphysical categories, even with all the *provisos* in place concerning points (1) and (3).

Similarly, the nudge of truth contained in the claim that categoricality and dispositionality are identical, *and, in turn, identical to the property itself*, seems to be that there is no detachable categorical or dispositional aspect (or second-order property) to a powerful quality. A powerful quality is a simple property, with a simple nature; claims (1), (3) and (4) (together, perhaps with the more elusive (5)) are sufficient to express this; Strong Identity does nothing but muddle the water. Overall, it seems to me that Strong Identity, albeit explicitly defended on some occasions, is a disposable claim for the PQer; insofar as Weak Identity holds, and claims (1) and (3) to (5) hold, the PQer position is well-represented without falling into the difficulties presented earlier.

11. Categoricity and dispositionality

The next step in the articulation of PQ is how to understand "powerful" and "quality" in "powerful quality". PQers claim properties to be both categorical and dispositional, but what is it for a property to be categorical, and what is it for a property to be dispositional? In our quest for the categoricity and dispositionality of powerful qualities, some limitations are in place; first of all, we must be careful of not interdefining the two categories by negation, for that would make a powerful quality both dispositional and non-dispositional, thus making PQ contradictory by default. Secondly, we must define categoricity and dispositionality consistently with claim (3); whatever is it for a property to be both categorical and dispositional, the two qualifications must not generate any internal complexity in the property; a property cannot be categorical in virtue of having a categorical part, side, or aspect –and similarly for dispositionality.

The characterization of the categoricity and dispositionality in a powerful quality must also be pursued in order to understand how exactly a property can be both. Unless a more articulated, and not mutually exclusive characterization of both notions is provided, we will always have to face Armstrong's worry that the R-Identity deployed by the PQer is unacceptable.

Perhaps even more importantly, as we have seen in Chapter 4, categoricity may be added to a property in order to dispel some regress argument against pure powers –arguments according to which a world of pure powers is sorely lacking in… something. Whether or not categorical properties (thus, powerful qualities) can provide this fateful "something" depends on what their categoricity consists into.

Fortunately, in our quest for categoricity and dispositionality we do not need to start from scratch. I have introduced and discussed both notions in Chapter 4; in that Chapter, I have presented several

ways to understand the divide between the categorical and dispositional, and characterizations deployed then will come in handy now.

5.1 The modal way

The reader will remember that a fairly straightforward way to set up a divide between the dispositional and the categorical, is a primarily modal way. According to it, a property is dispositional if and only if it necessarily makes the bearer so-and-so empowered, no matter the circumstances; on the contrary, a categorical property may, or may not, make the bearer so-and-so empowered, depending on the circumstances. (Similarly, it may be claimed that dispositional properties necessarily play the causal and nomic roles they play, whereas categorical properties play those roles only contingently).

Although this distinction has been occasionally upheld, we have found it lacking in many respects; first and foremost, because there is nothing to stop foes of powers from accepting necessary laws of nature, thus allowing categorical properties to confer powers to their bearers out of necessity (or to necessarily play the causal and nomic roles they actually play). Furthermore, this conception of the divide is unacceptable for the PQer –as it introduces the dispositional and the categorical as mutually exclusive categories. This is explicitly stated, for instance, in Bird (2007a: 66):

> "[w]hat we mean by 'categorical' must be understood in negative terms. That is, a categorical property does not confer of necessity any power or disposition."

In short, this modal divide between the dispositional and the categorical cannot be accepted by PQers; but this is not really a problem –since we have seen that it is independently problematic.[103]

5.2 The identity way

As we have seen in Chapter 7, PPers claim that properties are dispositional in the sense that they get their identities in terms of their dispositional profiles (<stimulus, manifestation> pair(s)), –rather than having a primitive identity, viz. a quiddity.[104] An alternative to PP that has been occasionally discussed is the "double aspect view" of properties, as in Hawthorne (2001: 361-362), and Bird (2007a: 72). This is the idea that properties get their identity in terms of their dispositional profiles, –but that they also pack a quiddity with them; which, unlike PP, allows for distinct dispositional properties having the same manifestations.

The relation between the "double aspect view" and PQ has not been fully explored. Keep in mind that, with the notable exception of Jacobs (2011), whose version of PQ is non-standard, PQers do not claim that properties are qualitative in the sense that they are quiddities. But there are other reasons to doubt that "the double aspect view" is compatible with PQ. For one, the PQer shuns the notion of a property with a compound nature, with both a dispositional component and a quiddity; and yet this is what the double aspect view seems to *prima facie* dictate. All in all, it remains the question whether PQers can accept to set up the dispositional/categorical divide as a distinction about how properties get their identity –without making the two categories mutually exclusive. To be sure, a PQer might reasonably claim that a powerful quality is a quiddity, but can she claim that it also is a dispositional property, in

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[103] Schroer (2013: 64), in presenting his version of PQ, introduces dispositional and categorical properties in this modal way; and never comes back to it. I am not sure whether he is aware of this difficulty.

[104] More specifically (as in Chapter 7), we can now understand quidditism as the thesis that properties have primitive individuality properties, viz. they primitively are the properties they are, and not others. In the last two Chapters, I will talk about quiddities as properties with "primitive identities" for brevity.

the sense that it gets its identity dispositionally? This seems unlikely; first of all, one might get the idea that if a property gets its identity primitively, that excludes that the identity is fixed in any other way. What would be the point in claiming that properties are individuated both primitively and dispositionally? Exploiting the comparison between quidditism and haecceitism, it would be like having an object with an haecceity, and essential properties as well. First of all, this would not allow for merely "haecceitistic differences" between pairs of worlds –because of the essential properties. Secondly, that would not allow for essential properties to play a pivotal role in individuation, since the haecceity is more than enough to perform that task. This isn't sufficient to conclude that it is metaphysically impossible to have objects with both haecceities and essential properties –but the two clearly trump one another; for example, one can reasonably conclude that one of them is not doing any job and therefore has to be excluded, for parsimony reasons. Something similar holds for quiddities and essential dispositional profiles. Incidentally, no PQer explicitly claims that properties get their identity dispositionally, through their manifestations –viz., it doesn't seem to be part of the PQer's claims that a powerful quality is dispositional insofar as it is so-and-so individuated, it has such-and-such identity or essence.

In conclusion, we can exclude this identity-based characterization of dispositionality, although we should remain open to the possibility that a powerful quality might be a quiddity.

5.3 The relational way

In Chapter 4 I have introduced the possibility of having dispositional directionality, as a genuine relational link between a power and its manifestation, as the mark of the dispositonal. In Chapter 6 I have argued it to be a perfectly tenable position. So, do PQers claim that powerful qualities are dispositional, in the sense that they are (essentially) directed to a manifestation?

Clearly, no. The reason is quite simple. A characterization of dispositionality through the notion of directionality to a manifestation contrasts dispositional properties with categorical properties, in the sense of non-directed "self-contained" properties. Yet this immediately makes categoricity and dispositionality two mutually exclusive categories, and turns PQ into an unacceptable position by default. Many PQers reject a relational account of dispositionality in light of the Meinongian Argument; whichever our verdict might be on that argument (see Chapter 6), however, its conclusion fits extremely well with PQ. Taking seriously the idea that powers essentially "point towards something beyond themselves", produces unacceptable consequences for the PQer; if indeed one was to think of genuine R-powers as essentially directional or relational items, one would indeed share Armstrong (2005: 315) conclusion that, again,

> "[i]f anything is a category mistake, it is a category mistake to identify a quality - a categorical property - and a power, essentially something that points to a certain effect. They are just different, that's all."

The PQer would turn this argument on its head; the absurdity of this identity is not to show that the identity between R-powers and R-qualities does not obtain –it rather shows that R-powers are not essentially directed to anything. PQers can use the Meinongian Argument to support this conclusion. Martin (1997: 216):

> This claimed identity […] is not a matter of one aspect being non-relational (the qualitative) and the other aspect being relational (the dispositional). This is because dispositionality is *not* a relation between what is dispositional and what is its manifestation. It is not a relation because the dispositional can fully exist and

be 'ready to go' with the total *non*-existence of the manifestation and the reciprocal disposition partners needed for the manifestation."

And thus, for a more positive conclusion, Martin (2008: 4):

"This directedness and selectiveness even to what is absent or non-existent (as with a substance that is soluble in a solvent that does not exist in nature and only a shortage of funds blocks its manufacture) is intrinsic to the dispositionality of the properties of all entities."

This tell us what dispositionality is not (a relation or, more vaguely, a direction), but leaves us in the dark as to what it positively is. The idea however is that the selection of a stimulus and manifestation pair is a fully internal affair of the property, and presumably a primitive one as well. Heil (2003: 123-4) thus writes that:

"[the PQer] would not want 'connections' among powers to reside outside those powers. It does not follow, however, that the connections reside inside the properties. The truth-maker for the claim that Fs together with Gs would yield manifestation M is not something in addition to F and G, not even some detachable component of F and G, but just F and G: it is 'of the nature' of F and G to yield manifestation M. This is what it means to say that properties are powers or that powers are 'built into' properties."

This brings us closer to the characterizations positively offered by PQers about dispositionality and, contrariwise, categoricity.

12. PQers on dispositionality and categoricity

Here are some positive claims of PQers about dispositionality, the genuine dispositional character that makes a powerful quality an R-power; all of them appear to be going in a somewhat similar direction. Fist, Heil (2003: 79):

"I shall use 'dispositional' to designate properties that bestow powers on their possessors in the following sense: it is solely by virtue of possessing a given dispositional property that an object possesses a given power."

But also Taylor (2013: 94):

"As I understand the term, a dispositional property is any property to which it is essential that it conveys upon the object that instantiates it the power to behave in a certain way given certain stimuli."

Finally, Jacobs (2011: 90):

"To be powerful is to be a nature sufficient to be (part of) the truth-maker for the counterfactuals."

The first two formulations suggest that the mark of dispositionality, the special ingredient that turns a property into an R-power, is that it is all that it takes to "confer" or "conveys" powers (or "dispositions) to its bearers. As we have seen in Chapter 3, these possibly confusing expressions are to be read as follows: a property is an R-power if it is sufficient to confer, or bestow, W-powers to its bearer. That is to say, genuine powers or dispositional properties are responsible for things being so-

and-so disposed (in the weak sense that dispositional sentences are true of them). This is incidentally closer to the Jacob's passage, which states that dispositional properties are responsible for the truth of a counterfactual.

This means that powerful qualities are necessarily associated with <stimulus, manifestation> pair(s), but, for PQ, a property is not directed nor related to any such thing, nor gets its identity in virtue of them; on the contrary, it has those stimuli and manifestations, rather than others, in virtue of the property it is. How that is achieved non-relationally, assuming stimuli and manifestations to be distinct entities from the power itself, is a problematic detail that I am not going to discuss –for instance, Martin (1997, 2008) usually claims that manifestation selection is an internal affair of a property, whereas Heil (2003: 94) states that dispositionality is "built into the property", and it is not just "a contingent add-on". But no characterization of the property itself is offered that shows exactly how this selection takes place –and manifestation-selection can be taken to be a primitive affair of the property.

These characterizations of dispositionality, mind you, are not "intrinsic" or "essential" characterization of a property. They do not describe how it intrinsically is, or what its nature is; they rather characterize it relatively to some metaphysical function that it is able to perform. In this case, selection of <stimuli, manifestation> pair(s), and thus, the grounding of W-powers (and dispositional truths).

Now, what about categoricity? Usually PQers support a rather broad, and metaphysically thin, conception of categoricity. For example, in Heil (2003: 79):

> "In an effort to diminish terminological uncertainty, I shall use 'qualitative' to designate intrinsic qualitative properties of objects, properties often classified as 'categorical'."

Also Taylor (2013: 94):

> "A better way to understand the term is that qualitative/categorical properties essentially contribute to the overall makeup of how an object is now."

Additionally, Ingthorsson (2013: 58) clarifies that "the notion of pure quality is a part and parcel of many mutually exclusive ontological views", but he goes on to propose that there is a "proto-idea" of quality, that is to say, a property that is "simple, first-order, independent, intrinsic, monadic, objective, actual or occurrent, and determinate."

Thus, a property is dispositional insofar as it is sufficient to convey or bestow W-powers to its bearers, or if it sufficient to ground dispositional truths; whereas, a property is categorical insofar as it is a "qualitative" property that contributes to the overall makeup of how an object is, currently and actually.

Many PQers, I suspect, would agree with this way of drawing the divide between the categorical and the dispositional, and it is important to highlight its virtues. As far as I can see, there's three of them. First of all (obviously), on this characterization, categoricity and dispositionality are not mutually exclusive, which allows for a property to be both categorical and dispositional. Secondly, a property is allowed to be both categorical and dispositional while retaining a simple nature. The two distinct categories of categoricity and dispositionality do not ascribe a certain nature to the property, so that they will have to wrestle for supremacy, and eventually parcel the property in two parts. Thus, both (1) and (3), two signature claims of PQ, are preserved. Thirdly, as we will see in the next Chapter, this characterization of dispositionality proposed by PQers will play a crucial role in a definition of dispositionality for all manners of R-powers, effectively ending my quest for dispositionality and my discussion on the question of realism for powers.

Incidentally, it is worth noticing that this characterization of both categoricity and dispositionality is incompatible with Strong Identity (viz., the claim that categoricity and dispositionality are identical, and then identical to the property itself). After all, consider again the characterization given by Heil (2003: 79) that I just discussed.

> "I shall use 'qualitative' to designate intrinsic qualitative properties of objects, properties often classified as 'categorical'. I shall use 'dispositional' to designate properties that bestow powers on their possessors in the following sense: it is solely by virtue of possessing a given dispositional property that an object possesses a given power."

These two characterizations may allow for a property to be simple, but according to it, a property being categorical is not the same as a property being categorical. It is one thing to be an intrinsic qualitative property of an object –and another to bestow powers on its possessor. There *is* a real difference between a property being dispositional, and the property being categorical –although that difference does not amount to any internal complexity of the property itself. Again, I suspect that, although many PQers express the identity in claim (2) as Strong Identity, they should stop at Weak Identity. For one, consider Jacobs (2011: 90); he claims that for a property to be qualitative is for it to be a quiddity, and for it to be dispositional is for it to be a truthmaker for a counterfactual; he then goes to add that this is all it takes to make his version of PQ an "identity theory", since:

> "The qualitative is identical with the powerful; one and the same thing is both identical with a thick quiddity and a nature sufficient to be (part of) the truthmaker for the counterfactuals."

Yet all Jacobs is establishing here is that one and the same property is both the quiddity and the truthmaker –not that being a quiddity and being a truthmaker are one and the same thing (how could that be?).

13. Quasi-triviality: a risk for PQ

Unfortunately, there is a problem in this characterization of PQ, and, more specifically, a problem with the characterization of categoricity. In fact, given this characterization of categoricity, the PQer risks making her position "quasi-trivial" (I will shortly explain what I mean by it).

According to PQers, a property being categorical amounts to it being "qualitative", viz. to contribute to overall makeup of how an object is, or, following Ingthorsson (2013: 58), it amounts to the property being "simple, first-order, independent, intrinsic, monadic, objective, actual or occurrent, and determinate." These characterizations are, as I hinted, metaphysically thin, in the sense that they hardly isolate a certain subset of properties with certain characteristics –rather, they seem to be applicable across the board. This isn't exactly true, of course; intrinsic properties are distinct from extrinsic ones, and determinate properties are distinct from determinable ones, etc… Thus, the PQer's claim that properties are categorical is not entirely trivial. Yet it is quasi-trivial, in the sense that it is not sufficient to distinguish this position from other variants of power realism. Remember, PQ is a peculiar stance within the power realist camp, insofar as it claims that properties, aside from being dispositional, are *also* categorical. This contrasts PQ with, say, PP. But, given this thin characterization of categoricity, would a PPer deny that properties are categorical? The answer is: probably not. Hence, the PQer's preferred notion of categoricity is quasi-trivial.

There are several ways to go about arguing for this conclusion. Firstly, consider Ingthorsson's claim that categorical properties are "simple, first-order, independent, intrinsic, monadic, objective, actual or occurrent, and determinate." In claiming that categorical properties are qualitative, Taylor (2013: 94) presumably meant something similar, for he took qualitative properties as occurrent and actual properties that qualify something as it actually and currently is.

> "Sphericity, for example, is a qualitative/categorical property because it contributes to the overall makeup of how the object is now. Borrowing a useful idea from Lowe (2006), we can say that qualitative/categorical properties are occurrent."

Does a PPer deny such features to a pure power –given that she rejects the claim that dispositional properties are not categorical? Of course not. We can easily see, using Bird (2007a) as a textbook case of PP, that PP in fact claims pure powers to be first-order properties (Bird 2007a: 140), intrinsic (Bird 2007a: 166), actual (Bird 2007a: 105), and determinate (Bird 2007a: 136). This is but an example; there's no place here to present more evidence to this conclusion, however, it seems to me that many PPers would happily assign each of Ingthorsson's adjectives to pure powers. As for a*ctuality*, specifically, the actuality of powers can hardly be taken as a signature claim of PQ, but rather as a reaction to antirealism about powers that all power realists will want to get behind to (e.g. Mumford 2004: 174). To embed the actuality of powers into their categoricity is a dialectically confusing move, for it makes PQ a position one can hardly escape.

Perhaps the PQer will have more luck insisting that powerful qualities are *qualitative*, in the sense that they "contribute to the overall makeup of how an object is now" (Taylor 2013: 94). Yet how is that supposed to help? Surely a PPer does not want to claim that dispositional properties do not contribute to the makeup of an object. "Qualitative", just like "categorical" is a deceptive claim; it is unclear how to formulate a metaphysically substantial definition of qualitativity, which will effectively separate the power realist camp between those who take powers to be qualitative, and those who do not. Alternatively, "qualitative" simply means "categorical", and then we are back to square one.

In general, the PQer's characterization of categoricity is so thin that it makes it unclear how anyone could deny that dispositional properties are categorical. Surely a PPer does not want to claim that dispositional properties are not intrinsic, occurrent, actual, or that they do not contribute to the make of an object; and similarly, if the PQer's idea is that a categorical property is a "quality", in the sense of a qualitative property –in whatever sense of the word, the PPer would agree as well. And similarly for every other similar characterization of categoricity. A pure power, a PPer might want to claim, is all of that *and then some*; maybe, according to the PPer, because it has dispositional essence, or because it is identified dispositionally.

Sometimes, in the defence of PQ, this thin conception of categoricity is paired with a modal understanding of dispositionality such as the one dismissed in Chapter 4 (and earlier on in this Chapter) according to which a power is a possibility involving its bearer. Then PQ, understood as the claim that properties are both categorical and dispositional, turns into the claim that properties both qualify the bearer as it currently is, and enrich it with possibilities; a powerful quality is, as sometimes claimed by Charles Martin, a mixed bag of act and potency. E.g., Martin (1997: 215):

> "The dream of either a purely qualitative, non-dispositional or a purely dispositional account of properties is philosophical fantasy. No property is in 'pure act', free of all unfulfilled potency unless it is a property of God (or perhaps the number 2). And no property is only its capacity for the production of further capacities for…"

This is too easy a refuge for the PQer, and too hard a target for her adversaries. The Categoricalist must not be forced to chase God, or the number 2, to make her case: she is allowed to claim that many, perhaps even all (categorical) properties bring to their bearer some unfulfilled potentiality, even without claiming that those are to be considered "dispositional" properties in any significant sense of the word. Contrariwise, a friend of powers is not forced to claim that there is no actuality in the world if she wants to exclude categorical properties (we have discussed this at length in Chapter 4).

It is hard to see this quasi-triviality of PQ as a virtue of the position. Not only because, in general, triviality is hardly a philosophical virtue. But also, and most importantly, because it suggests that the opposition between the PP and PQ is, at the end of the day, based on a play on words: more precisely, the word "categorical". Originally PP and PQ have been introduced (as in Chapter 4) as direct competitors on the market of power realism; according to the former properties are "just dispositional", whereas for the latter they are "also categorical". But this opposition appears insofar to be illusory –for the categoricity the PPer is denying to properties is not the same the PQer is accepting in properties.

Furthermore, this metaphysically thin conception of categoricity lays waste of any hope of deploying PQ in order to stop any regress argument against pure powers. This was, the reader will remember, an important selling point for the PQer. However, what exactly does the categoricity of a powerful quality add to the world? One can hardly see how any progress can be made by using the thin conception of categoricity; if the categoricity of a dispositional property amounts to the fact that the property is, say, actual, this will hardly score any point for PQ, since PPers take pure powers to be actual as well. As we have seen in Chapter 4, the proper response to an actuality regress argument does not rely on adopting PQ, but merely on pointing out that power realism is not committed to the claim that powers are not actual; a position that is of course open to PP as well. On the contrary, one needs to add something metaphysically more substantial to the categoricity of a powerful quality, in order for it to add something to the world, something that a world of pure powers sorely lacks.

In conclusion, for PQ to work as intended, it must not be quasi-trivial. Fortunately for the PQer, however, quasi-triviality can be avoided. To my eyes, there is a fair way to reconstruct PQ, and the opposition between PQ and PP. As we have seen in Chapter 7, when PPers claim that dispositional properties are not categorical, what they mean by it is that they are not quiddistic properties; viz. they do not have any primitive source of identity. Furthermore, as above, PQers in general appear to be open to the idea of properties having quiddities. (Keep in mind, however, only one PQer has explicitly claimed that "quality" in "powerful quality" actually stands for a *quiddity* (Jacobs 2011), whereas other PQers usually resort to the less metaphysically substantial characterization of categoricity seen above.) It might therefore make PQ less trivial of a position to claim that qualities, viz., categorical properties, are quiddities, that is to say properties whose identity are fixed primitively, and whose selection of a manifestation is a primitive and internal matter to the power itself (see Chapter 6).

Furthermore, this characterization of categoricity can easily be paired with the characterization of dispositionality usually put forward by PQers. Thus, a property is dispositional insofar as it is sufficient to make its bearer so-and-so empowered, and thus, to ground the corresponding dispositional truths; but it is also categorical, in the sense that it is quiddity. This reconstruction of PQ is consistent with claims (1), (3), (4) and perhaps (5), and, thus, it is a fair way to articulate the idea that properties are

powerful qualities –although, it is worth noticing, it constitutes something slightly more substantive than standard PQ (at least when it comes to the categoricity of properties).[105]

14. Conclusions

In this Chapter I have discussed PQ, according to which (all) properties are both categorical and dispositional. This position is supposed to solve at least some of the worries concerning a world of pure powers.

However, because of the "surprising identity" (Martin 1997: 216) between the categorical and the dispositional, this position is a possibly obscure one; it is also a very unstable position, as the question of how exactly can categoricity and dispositionality coexist in a (simple) property may deflate PQ into a metaphysically less substantial position, such as NM; relatedly, the fact that occasionally PQers relied on the analogy with ambiguous drawings to ease this difficulty surely did not help.

I argued for the existence of stable and metaphysically substantial version of PQ, according to which simple properties are both categorical and dispositional. However, this required some degree of manipulation of the claims often put forward by PQers. First of all, I rejected the claim that categoricity is the same than categoricity, rather relying on the weaker claim that every categorical property is identical to a dispositional property –and vice versa, and that all properties are simple, without dispositional sides, or aspects, or detachable components.

Furthermore, I had to reinforce the notion of categoricity usually put forward by PQers in order to properly distinguish the position from other variants of power realism (especially PP) –and in order to make the addition of powerful qualities a meaningful addition to the world. In passing, I have identified a very interesting characterization of dispositionality, one that is usually employed by PQers, and that I wholeheartedly accept. According to this characterization, a property is dispositional insofar as it is sufficient to confer or convey some power to its bearer (in the sense that it is sufficient to ground some W-power); or, relatedly, it is sufficient to ground some dispositional truth involving its bearer.

This immediately sets up the topic of the next, and last, Chapter of the thesis. In the very beginning of this thesis, it has been submitted that the position of the power realist is obscure, as there is no widespread agreement between power realists as to what exactly the dispositionality of properties amounts to. Many candidates have been discussed. This last characterization, as we will see in the last Chapter, may indeed be worthy of being called "the mark of the dispositional". More generally, now that we have both explored PP and PQ, we are in a position to take a step back and observe the realist camp in its entirety.

[105] If anything, the version of PQ that comes closer to mine is the aforementioned Jacobs (2011); although I do not exclusively characterize dispositionality in terms of truthmaking. For more details on this grounding/truthmaking-based characterization of dispositionality, see the next Chapter.

CHAPTER NINE
A WORLD WITH POWERS: A FINAL WORD

15. The road behind us…

In the previous Chapters we have explored several variants of realism about powers, each with its own strengths and weaknesses. Most importantly, we have discussed the Pure Powers view (PP), according to which properties are exhausted by their dispositionality, and the Powerful Qualities view (PQ), according to which properties are both dispositional and categorical. Where does this leave us?

Regress arguments against PP have mostly been hit and miss; but the identity regress argument, especially in a particularly robust interpretation, not dissimilar to what Ingthorsson (2015) has called the "nature regress argument", highlights just how metaphysically revolutionary the position really is. In fact, PP, at least in its standard formulation which we can find in Bird (2007a, 2007b), comprises a deeply relational account of dispositional properties, which makes for an intensely revolutionary metaphysics; at least vis-à-vis the ordinary worldview of (material) objects instantiating intrinsic and monadic properties. PP may very well be the cornerstone of a "new theory of everything" that an R-realist may decide to embrace.

PQ, by providing an identity between the dispositional and the categorical, promises to avoid such a radical conclusion, allegedly offering a reconciliation between a world entirely built out of categorical properties, and a world entirely built out of dispositional properties. The PQer, in a way, trades a problem for another; for how exactly can every dispositional property be categorical as well? Whether PQ really solves the regress arguments against PP –and whether it is really acceptable to have properties both categorical and dispositional–, crucially depends on our characterizations of both notions. I have argued for the existence of a stable and metaphysically substantial position that deserves to be called PQ; a less radical position than PP, and one possibly closer to the familiar picture of reality I sketched in the beginning of the thesis.

However, one would err in thinking that a friend of powers is forced to choose between PP and PQ. Firstly, it has not been argued that these two positions are exhaustive of the landscape of power realism. Secondly –and more worryingly–, we have shown the opposition between the two positions to be somewhat apparent. The worry has been expressed that PP and PQ do not really disagree on whether properties are "just dispositional" or "also categorical" –they rather disagree on what those words mean. Part of this ambiguity, about the term "categorical", has been dealt with in the previous Chapter; although PQ is not standardly formulated as claiming that dispositional properties are qualitative in the sense that they are quiddities, one clear way to formulate the disagreement between PP and PQ (revolving around the categoricity of properties), is to formulate as a disagreement about the quidditistic nature of properties. PP rejects quiddities, PQ accepts them. In conclusion, we could conceive the discussion between a PPer and a PQer on whether dispositional properties are categorical, as a discussion about the acceptability of quidditism within the boundaries of power realism. On the contrary, thinner notions of categoricity are, as we have seen, too weak to generate any genuine disagreement.

Yet, if the disagreement between PP and PQ about the categoricity of properties is now (somewhat) clearer, the agreement between them over their dispositionality is still mysterious; for dispositionality is characterized in wildly different ways in PP and PQ. This casts a longer shadow on power realism, and it will be the topic of this last Chapter. I will explore the idea that many (dis)agreements in power ontology are in fact merely verbal, and are based on some equivocation around the expression

"dispositional"; the reason being, again, the lack of common ground on the dispositionality of properties. This is the perhaps the most troubling worry associated to the obscurity concerning the dispositional character of properties, as sketched in Chapter 1. But I will offer what I hope to be a satisfactory solution: in fact, investigation on this problematic will lead us to find a commonplace mark of dispositionality, that any friend of power, PPer or PQer as it may be, is in a position to accept (even if they do not explicitly do it). We may call it a minimal common ground on the character of dispositionality, viz. the special ingredient of a world with powers, as opposed to a world without powers; and should put many (dis)agreements in power ontology on a more solid foundation. Additionally, this should conclude our inquiry on the question of realism for powers as the question over R-realism, as introduced in Chapter 3.

Finally, I will talk about whether this mark of dispositionality is able to rise to the Governing Challenge –as introduced in the very first Chapter. In short, it cannot. This is interesting in its own right; for it suggests that this minimal common ground on the nature of dispositionality is not sufficient to explain how powers inform the world with a natural order, with possibilities and necessities. This means that, as it is, power realism exists in a merely programmatic state: it is not really a departure from neo-Humean metaphysics, but an announcement thereof. This isn't the end of realism about powers –on the contrary. The Governing Challenge remains open; what power realists minimally agree upon about the character of dispositionality is but a stepping stone towards a deeper and more complete understanding of a world with powers.

16. (Dis)agreements about dispositionality

Here is the problem about dispositionality. Even if we can tentatively stipulate some agreement between PP and PQ about categoricity, no such compromise is forthcoming about the dispositionality of properties, viz., the mark of genuine R-powers. As claimed in previous Chapters, PPers usually accept the characterization of dispositionality in terms of the identity of properties, and they claim that properties are identified, and perhaps even related, to one or more characterizing manifestations. This is manifestly not what is claimed when PQers claim that qualities are powerful as well; summarizing the last section of the previous Chapter, for PQ properties are dispositional in the sense that they are sufficient to confer W-powers to their bearers –they are all it takes to make their bearers so-and-so empowered.

This lack of agreement is seldom recognized, but is, in my opinion, deeply problematic: both PP and PQ are *realist* positions about powers, in the sense that they are R-realists, they accept the existence of properties bearing a mark of the dispositional –something that makes them dispositional in character. However, they disagree on what this mark is; thus their claim "there are powers" (in the sense that there are R-powers) might turn out to be motivated by fundamentally different facts about the world; and this casts some doubt on the idea that they have, in virtue of their theory of powers, any shared substantial ontological commitment.

What is the danger, here? Taking a step back, it may be worthwhile to explore an analogy suggested back in Chapter 1: the debate on mereological nihilism. This is a moderately clear debate; friends and foes of composite objects appear to have a pretty good grasp on the subject matter of their disagreement; albeit not explicitly stipulated, it may be easy for them to agree that they are discussing about "objects with proper parts", on a shared understanding of "part" obtained *via* the formal discipline of mereology. On the face of it, the debate over mereological nihilism involves an existence question, and many philosophers think about it that way; others, presumably a minority, would think

about it as involving the question of whether composite objects do really exist, or whether they are fundamental.[106] Others, perhaps hoping to protect philosophical theories from the layman's intrusion (who could point out that there is a tree with three branches in their backyard), would argue that the whole debate is formulated with the help of a special quantifier, in a distinct quasi-English language of metaphysics people systematically start to talk when it's time for the philosophy seminar.

That being said, I would still qualify the debate around mereological nihilism as "moderately clear" for the following reasons: first of all, whatever language shift one wants to employ in order to protect –by means of equivocation– the seminar room from pre-theoretical considerations, there is no reason to assume that the same equivocation occurs inside the seminar room. Unlike (perhaps) a nihilist and the layman, a nihilist and her adversaries *prima facie* appear to engage in meaningful conversation, disagreeing on a given set of sentences in a shared language and interpretation.[107] Secondly, the subject matter of the debate appears to be quit uncontroversial. Even if we were to indulge in this extreme exercise of distrust, it would be unclear why the equivocation would lie in the interpretation of homophones such as "part" or "composition". On the contrary, nihilists and their enemies can agree on a great deal of principles in the formal discipline of mereology to regulate the behavior of parthood and composition notions (e.g., the parties may agree to work within a somewhat "extensionalist" framework, on the basis of Lewis (1991); the nihilist cannot accept the Universality of Composition, but can accept the transitivity of part, and, vacuously, the Uniqueness of Composition; more generally, the nihilist can vacuously accept a vast portion of mereology, as a theory of identity). In short, there is a whole lot to help the two parties stipulate what it is exactly that they are talking about. The contrary opinion, according to which nihilists have completely changed the subject in virtue of their disagreement on composite objects, appears to be simply preposterous. It is hard to believe that, once principles involving the existence of sums are removed, there is no available "residual essence" (Quine 1970: 81) left of mereological concepts. Furthermore, the nihilist could withdraw from agreement and disagreement alike when it comes to a number of metaphysical features of composite objects (such as the Uniqueness of Composition). After all, they do not need to engage in any theory purporting to explore the nature of things they ban from existence –much in the same way in which an *ostrich* nominalist will refuse to discuss whether properties are particulars or have repeatable instances. For the purpose of the debate, the nihilist minimally needs to characterize composite objects as objects with proper parts. She needs not agree nor disagree with her adversaries on most metaphysical features of composite objects. Their disagreement is, *per se*, an ontological one –one about the existence of composite objects.

Things unfortunately are not so easy in the debate about powers powers. In the burgeoning debates between the friends and foes of powers, the "neo-Aristotelians" against their "neo-Humean" foes, it is

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[106] For the first position, see van Inwagen (1990: 99-100), Sider (2011: 170-171), and Korman (2015: 66ff). For the second, Schaffer (2009: 361) and deRosset (2010). Korman (2015) would claim that the question about composite objects is an existence question, since virtually everyone would agree that composite objects are not fundamental anyway (they depend on their parts, and perhaps, their arrangement).

[107] See Dorr (2005). Hirsch (2009) argues that even if there was, for each party of the debate a language/interpretation according to which the uttered sentences would come out true for the other, the debate wouldn't be merely equivocal until both parties settle that they are respectively talking such languages –and thus, talking past each other. This usually doesn't happen, nor does it seem to be a charitable interpretation of the incriminated sentences. According to Manley (2009: 11):

> "Surely the fact that [the parties involved] intend to mean the same thing by the relevant sentences, and thus take themselves to be genuinely disagreeing, ought to have semantic significance."

not entirely clear what kind of entity is under scrutiny. Not only power ontology lacks an uncontroversial theory or framework (let alone a formal one) which might help understanding what exactly one is talking about: even worst, as we have seen, there are positions, even within the realist camp (e.g., PP and PQ), which crucially differ on what the dispositionality of properties consist into.
And therefore, if there is no shared agreement on what the mark of dispositionality is, between friends and foes of powers, or even between friends of powers, just how substantial can the discussion be? How can two parties (dis)agree on the existence of powers, without a clear and shared stipulation of what such things are supposed to be? On the existence of *what* exactly are they (dis)agreeing about? This worry can be raised (and has been raised) in a number of debates in contemporary metaphysics; and it relates, at least within the framework of Quinean metaontology, to the questionable priority of ontology (as the study of what there is) over metaphysics (the study of what it is). E.g., Varzi (2011: 409) urges us to consider Alpha and Beta, two philosophers who allegedly agree on the existence of material objects, even if they subscribe to radically different accounts about their persistence, constitution, and so forth; then,

> "surely there is an important sense in which our two philosophers could be said to share the same ontology, at least partly: both acknowledge the existence of ordinary material objects […]. It is also apparent, however, that they have radically different opinions regarding such things. In what sense, then, is it plausible to consign this divergence to a metaphysical sphere that would only start spinning when the ontological sphere comes to a rest? How can we say that Alpha's and Beta's inventories include the *same* entities, if the entities they include are metaphysically *different*?"

A bad answer to Varzi here would be that he is equivocating on the meaning of "same" and "different"; in the first case, the word means "numerically the same", while in the second, he means "qualitatively different" –yet, how could arbitrary entities x and y be numerically the same if they are qualitatively different? E.g., if x endures, while y perdures –how can they be the very same thing, on the existence of which Alpha and Beta are in accord?
Furthermore, it seems to me that not all entities are on the same boat. For certain kind of entities, e.g. those to which we have no easy epistemic access to, and which we cannot simply stipulate into existence, the danger appears to be very real that, down the line, metaphysical disagreements may render moot some previous ontological agreement. This could be the case of God: believers of different monotheistic religions might eventually decide, in virtue of their disagreements in matters of dogma and theology, to part ways even relatively to their agreement over the existence of God; after long discussions, they can simply come to the conclusion that they were not talking about the same thing –and that their previous agreement was just a misleading verbal agreement (although perhaps some weaker form of ontological agreement can still be formulated). On the contrary, the priority of ontology over metaphysics seems more stable in the case of entities for which there is easy epistemic access. E.g., material objects; by mere ostention, two parties can agree on the semantics of "material object" and the existence of material objects, and then move on to the background metaphysics, where disagreements are bound to pop up. Here, the priority of ontology appears to be less problematic (imagine how absurd the contrary situation would be like: e.g., an endurantist and a perdurantist, that in virtue of their metaphysical disagreement about persistence and transtemporal identity, decide to give up their ontological agreement over material objects).
I take these worries about the priority of ontology over metaphysics to be *prima facie* valid. And more specifically, there appears to be a problem concerning the ontological agreement on the existence of

powers.[108] In order to see it, we can consider the ontologies of the PPer and PQer –and consider in virtue of what both of them warrant being called a "power ontology". This is what I will now discuss.

17. The mark of the dispositional

The ontologies of PPers and PQers are profoundly different; the first is a deeply relational ontology, which has been occasionally criticized for being too *relational* –as it can be considered, under some assumptions, to be one of those "structure all the way down" kind of ontology. The second, on our newfound understanding of the position, is an ontology of self-contained, isolated, monadic, presumably intrinsic quiddities possessed by objects (supporters of the powerful qualities view such as Charles Martin and John Heil are deeply entrenched in an two-category ontology, with both individual substances and properties). In short, the ontology of the PPer and the PQer are profoundly different outlooks about the world and its inhabitants; their differences are not limited to properties, but bleed in several other areas of metaphysics. Let us concentrate on properties again. The properties posited by PP and PQ have a different kind of identity and internal make-up, so whence their agreement over the claim "there are genuine powers?", or "(some) properties have a dispositional nature"? In other words, what is the source of their agreement on the fact that the world is populated by entities bearing genuine powers? The worst possible scenario is the following: PP and PQ have talked past each other. They have developed two completely different theories about properties but decided, for whatever reason, to both use the terms "powers" and "dispositions" to refer to its items; "power" is, after all, a term of art, whose use does not appear to be robustly restrained by anything. The original hope of the PPer and the PQer was to propose two variants of a more general position (viz., realism about powers), distinguished by two accounts of the nature of its items. According to one, properties are "just dispositional", and according to the other, they are "also categorical". But this might not be the case.

This is a worry that has loomed in the background of this thesis through many of its Chapters, and it is now time to face it. Fortunately for the power realist, I will argue that the worst possible scenario is not the actual one. Power realism, and the ontological agreement between PPers and PQers, is not based on an equivocation. There is, on the contrary, a specific feature shared by pure powers and powerful qualities; furthermore, this feature warrants being called a "mark of dispositionality". PP and PQ are both theories about powers, and two variants of R-realism. Thus, we can end our characterization of R-realism as the genuine bone of contention in the question of realism for powers –and finally offer some clarification on what realism about powers really is.

To see this, consider PQ again. According to it, properties are quiddities; they have no essential relation to any stimulus nor manifestation. This doesn't mean, however, that an object having a property is modally independent from it being so-and-so empowered; in fact, this isn't the case. Powerful qualities and W-powers are not contingently paired –but necessarily so. It is necessary that if something has a specific powerful quality P, then it is disposed, and presumably would, behave in a certain fashion given certain circumstances. So, even if a powerful quality has a simple and non-relational nature, PQ entails that there are modally strong connections between properties. Ultimately, this picture is strongly anti-Humean in the sense that laws of nature, if anything at all, are not contingent: as long there are the same properties, the same laws hold of them. The behavior of an object in a set of circumstances does

[108] Furthermore, it appears to me that the case of powers is closer to the case of God, than the case of material objects (although I cannot exclude that I can be proven wrong). For there hardly is any straightforward access to powers –in the sense of robust R-powers–, that may put ontological agreement about powers on solid ground, once we get to the dirty work of metaphysics. I will not pursue this point further.

not vary freely from the properties it has. To be sure, PQers do not usually frame their positions in terms of laws of nature –which on their theory, if anything at all, are highly derivative entities. But for this specific claim, Heil (2003: 92ff, 2005: 345ff). Thus PQ displays the following features: it is a quidditist position, and takes laws of nature, as relations between properties, to be metaphysically necessary. Also it takes W-powers to be necessarily assigned to objects on the basis of the properties they possess.

None of these features is specific to an ontology of powers. In fact, I will now present a third position, called Q-NEC, which displays all such features: quidditism, and modally resilient W-powers and laws of nature. PQ and Q-NEC are thus very similar positions. However, I will try to build Q-NEC as a theory an antirealist about powers is in a position to accept. The mark of dispositionality in PQ will be obtained by way of contrast, verifying where it is that PQ and Q-NEC part ways. I will argue that there is a crucial difference between the two positions; consequently, this difference between PQ and Q-NEC is what makes PQ a power ontology –it is what accounts for *powerful qualities* being *powerful* in the first place. To be sure, the idea of comparing power realisms with forms of antirealism with modally resilient W-powers and laws, is not entirely new[109]: but is here in the forefront.

So, what is Q-NEC? Firstly, Q-NEC is a version of quidditism; thus properties have a primitive identity. Secondly, there are metaphysically necessary laws of nature connecting them; however, given that there is no dispositionality on this picture to account for such things, one needs primitive laws, perhaps as second-order relations between properties. According to this view, nomic relations obtain between properties as *external* necessities, namely, they do not depend on the *relata* or their nature. On the face of it, this is an ontology devoid of powers. Properties and laws, together, are the truthmakers of dispositional truths, and can be jointly taken to be the total grounds of W-powers. Because laws are necessary, properties and W-powers covary necessarily (just like PQ). At the end of the day, Q-NEC is a genetically engineered version of Armstrong's theory about laws and properties, a form of "necessitated Categoricalism" as discussed, e.g., in Tugby (2014: 3-4). The difference with "classical Categoricalism", e.g., Armstrong's position, is that in the latter, but not in the former, laws are metaphysically contingent, and so are the W-powers assigned to propertied objects.[110]

Now we can put Q-NEC and PQ side to side and evaluate their differences. In Q-NEC, as in PQ, the W-powers and nomic roles assigned to properties are the same from world to world: Q-NEC is, from a merely modal standpoint, as anti-Humean as any ontology upheld by the power realist. However, here is the difference between the two. Consider the status of W-powers in both Q-NEC and PQ. For Q-NEC, for something to be so-and-so disposed, one needs two things: a certain law and a certain property instance. Thus a quiddity, plus a necessary law, is what Q-NEC offers as the total ground for the instantiation of a W-power. The property, however partially responsible, is not sufficient to do the job on its own; individual property instances are rather partial grounds for W-powers, and partial truthmakers for dispositional truths. However, for the PQer, a single property instance is all that it takes for something to be so-and-so disposed; individual property instances are total grounds for the instantiation of W-powers, and total truthmakers for dispositional truths. In fact, powerful qualities are

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[109] Barker and Smart (2012), Schroer (2013: 64, fn. 3), and Tugby (2014: 3-4). Furthermore, Schaffer (2005) differentiates various ways for properties and powers to be necessarily correlated.

[110] A slightly different position would be the already mentioned Hawthorne's (2001) "dual aspect" view, where W-powers and laws are not only necessary, but *essential* of quiddities. Unlike Q-NEC, in this position W-powers and natural laws would probably obtain *solely* in virtue of properties. As I will now pass to explain, this is a clear indicator that, unlike Q-NEC, we are dealing with a power ontology.

supposedly all that it takes for the truth of dispositional sentences –nothing more needs to be added.[111] This grounding, mind you, is not a merely modal dependence: for in this respect, PQ and Q-NEC are the same: in both of them properties and W-powers necessarily covary. It thus makes sense to think of PQ as claiming W-powers to be grounded in properties in a more-than-modal way (viz., the metaphysical dependence at hand entails but is not entailed by modal dependence).

This is the crucial difference we were looking for. The ontologies of PQ and Q-NEC are exactly similar but for one respect: for the first, but not the second, individual property instances are all that it takes to ground W-power instances in their bearers. Given that the first, but not the second, is a form of power realism, this may suggest that the mark of the dispositional, necessary and sufficient conditions for a property (instance) to be a power, is for it to be a total ground, instead of just partial ground, of some W-power (instance).

This mark of the dispositional is not different from the one offered by PQers in the end of the previous Chapter, but we now see how important it is, in the overall dialectic between realists and antirealists about powers; for there are reasons to take this feature to be a mark of the dispositional that everyone in the literature, antirealists and realists of all stripes, are in a position to accept. PPers, for one, surely accept that instances of pure powers are all it takes to make something so-and-so empowered (to confer it some W-powers); to be sure, a PPer would probably say something more, about the identity and relatedness of powers, but she would probably agree with a PQer on this minimal point. In general, a friend of powers should agree that how an object is empowered primarily (and perhaps uniquely) depends on the properties it possesses. Contrariwise, an antirealist takes properties, viz. categorical intrinsically inert properties, to be just a part of the ground for W-powers; something else, say, a law of nature, has to come to their help for something to be so-and-so empowered.

Finally, although I have formulated my mark of the dispositional in terms of a grounding relation between individual property instances and W-powers, similar grounding relations could be considered between individual property instances and nomic or modal facts. According to PQ, laws of nature, presumably as generalizations that support counterfactuals, depend on individual property instances that are present in space-time. Whereas for Q-NEC nomic relations, and their necessity, have a primitive source; laws of nature are thus independent from what goes on at the realm of first-order property instantiations. It thus makes sense to think of PQ, but not Q-NEC, as claiming laws to be totally grounded in property instances in a more-than-modal way.

More generally (albeit quite tentatively), the difference between the properties in PQ and Q-NEC is that, only in the former, individual properties are uniquely responsible, in a more-than-modal way, for W-powers, nomic facts, and other various behavior patterns, like possibilities and conditionals that hold of the object. The PQer, and the power realist in general, posits a world of properties that is self-governing and intrinsically active, not just in the sense that there is no outside causal intervention; but because how an object is, is sufficient to settle, together with its surroundings, how it could or would behave in certain circumstances –without the need of an external mechanism, principle or source of modality. Such a world doesn't need to be put in motion: it puts itself in motion (as in Ellis 2001: 106ff). And realists of all stripes also largely agree that there can be some dispositional account of laws

[111] Although this is seldom stated, it seems implicit, at least for the PQers with a strong emphasis on truthmaking, as in Heil (2003, 2012) and Jacobs (2011).

of nature; so this also seems an acceptable criterion to recognize dispositionality in one's theory of properties.[112]

For now, let us concentrate on the grounding of W-powers; thus, we may take the mark of the dispositional to be the following: a property is a power if and only if it is the total ground (if a fact involving its instance is the total ground) of its bearer having some W-powers. If, as in Chapter 3, this mark of the dispositional constitutes necessary and sufficient conditions for something to count as an R-power, then a power realist (an R-realist) takes (at least some) property instances to be R-powers in the sense that they are all that it takes to confer W-powers to their bearers: R-powers are total grounds for W-powers (and perhaps total truthmakers for dispositional truths, if one is inclined to speak in terms of truthmaking).

18. Issues about the mark of the dispositional

There are many points that need discussing about this criterion for detecting dispositionality, for it bears some consequences about the question of realism for powers as a whole –and the metaontology we use to frame it.

4.1 An existence question, or a grounding question –but *not* an identity question

If this characterization of dispositionality is correct, two theories which share a commitment to R-powers (such as PP and PQ), are not necessarily sharing, in virtue of this agreement on R-powers, any commitment to something with a specific intrinsic nature or make-up. Nor to something with a specific identity. The very fact that PQ exists, and it is accepted amongst the ranks of the realists, is living proof that quidditism-based distinctions about the internal life of a property are not discriminating factors when it comes to the question of realism for powers. Furthermore, moving back to the "prescriptive" side of metaphysics, one would struggle to find an explicit argument to the conclusion that quiddities are incompatible with an ontology of powers (although many power realists have argued against quidditism *tout court*).

I have suggested in Chapter 3 that the debate over the mark of the dispositional, may not be a debate over the nature of properties. For it is said nowhere that a property is a power in virtue of a certain nature it possesses; in short, it is a *non sequitur* to claim that for something to bear the mark of dispositionality, entails for it to have a certain (intrinsic) nature. In fact, my proposed relational grounding-based account of dispositionality appears to be a counterexample to that: R-powers, genuine powers, are not properties with a specific intrinsic nature, but properties playing certain grounding roles. One could argue that this issue is not completely orthogonal from the debate over the nature of properties; after all, can this relational mark of dispositionality still be a characterization of a property's nature, even if a relational, or incomplete one? Furthermore, it may be possible that the relevant grounding relations obtain in virtue of the property's intrinsic nature (thereby making my mark of dispositionality just a stepping stone towards a deeper understanding of a dispositional property's nature).

Maybe. However, mere (dis)agreements over the existence of powers do not *per se* have to do with the intrinsic nature of properties. Although many power theorists think of powers as properties with a specific kind of nature, the simple acceptance of powers into one's ontology is not the acceptance of a

[112] Cartwright (1983, 1989, 2009), Lipton (1999), Ellis (2001), Molnar (2003), and Bird (2007a) all subscribe to a dispositional account of laws. Only a subset of them would explicitly claim that powers constitute a grounding base for laws.

specific kind of property, with a certain intrinsic nature, "internal make-up", or constitution. Similarly, one could also claim that usually power realists like to equip their theories with dispositional primitives, whereas antirealists would not. Here I would like to simply point out that something being primitive is not an intrinsic or essence-related characterization, but a relational one.

Relatedly, I reject the claim that dispositional directionality is the mark of the dispositional, as occasionally claimed by realists (Molnar 2003) and antirealists (Armstrong 1997) alike. This doesn't mean, again, that there is no such a thing as dispositional directionality; as I argued in Chapter 6, there is nothing inherently wrong in it; I only claim that dispositional directionality is unfit to be considered the mark of the dispositional.

This suggests a new way of envisioning ontological (dis)agreements about powers. Consider, by way of analogy, two people standing in front a closed box. The box occasionally shakes, and emits faint noises. Both people agree on the existence of something in the box, which is responsible for such occurrences. One of them thinks that it is a beetle –the other, a toy robot. This disagreement does not make their previous ontological agreement any less genuine: the two parties, simply put, are not agreeing on the existence of anything with a certain nature or internal constitution –be they beetles or toy robots– but they are nonetheless agreeing on the existence of something playing certain causal and explanatory roles. A third party could disagree with them by claiming that movements and noises from the box are not produced by an object inside, but in some other manner.

Something similar holds, I argue, in the debate between PPers and PQers, and, more generally, between all power realists: any two realists are agreeing on the existence of something performing certain metaphysical tasks; primarily, the grounding of W-powers, but possibly also the grounding of certain modalities and laws of nature. They are not necessarily agreeing on the nature, essence, or identity of properties, over their internal-make up or constitution. And, similarly, the antirealist about powers might disagree with both positions by denying the existence of something performing such tasks.

4.2 The grounding of W-powers: a dilemma between grounding and truthmaking

I have argued that the mark of the dispositional is to be obtained by considering grounding relations. A property is considered an R-power if and only if its possession by its bearer is a total ground for something to be so-and-so empowered (for the bearer to possess some W-power), or, alternatively for its bearer to fall in the scope of some law of nature. Also, for a realist (someone who accepts R-realism) individual facts concerning objects having properties are total truthmakers for dispositional truths –this is another sign that we are dealing with R-powers.

This position however suggests a dilemma, which I primarily formulate as about the relation between R-powers and W-powers (it could be equally formulated as about the relation between R-powers and nomic and modal facts). And it relates to the choice, discussed in Chapter 2, between grounding and truthmaking –as our go-to tool in metaontology.

I suggested in Chapter 3 that for something to have a W-power may merely be for some dispositional truth about it to hold. W-powers are, again, merely the product of disquotation –they are the result of our acceptance of dispositional truths. If the mark of the dispositional is the grounding of W-powers, this might ultimately reduce to the truthmaking of dispositional truths; thus something is a genuine power if and only if it is a total truthmaker for dispositional truths. The following dilemma consists in the fact that there is one good reason to think that is the case, and one good reason to think that is not the case.

First, the positive argument, the first horn of the dilemma. It's the reason for taking W-powers to be exhausted by dispositional truths. One may not want, for parsimony reasons, a conception of reality with layers, going from the fundamental to the derivative, from the real to the less real (the unreal?). Thus a realist might not feel comfortable with the claim that there are fundamental entities like R-powers, and less fundamental entities like W-powers, laws of nature, or modal/counterfactual facts. It might be better to just say that R-powers are truthmakers for dispositional, nomic, and modal/counterfactual truths.

This kind of reasoning might especially be true considering the grounding of laws of nature by R-powers. A realist doesn't need any metaphysical substantial or "governing" conception of laws of nature, like, e.g., the Armstrongian does; for R-powers are already doing the job of settling how their bearers would behave whenever they possess the relevant properties. Thus there might nothing more in laws of nature, than counterfactual-supporting generalizations, that is to say, descriptions of a subset of regularities. For instance, in substantial accord with the "lawless" account in Mumford (2004), Brian Ellis writes:

> "Laws are not things that exist in the world; they are things that are true of the world. […] The truth-makers for the relevant law of nature are, we hold, just the fundamental dispositional properties."[113]

Therefore there might be nothing more to the claim that R-powers ground laws of nature, than the claim that R-powers are the truthmaker for law statements. And something similar for the relation between W-powers and R-powers: there's nothing more to the claim that R-powers are sufficient to ground W-powers, than the claim that R-powers are sufficient to ground dispositional truths.

Now, for the second horn of the dilemma. Jacobs (2011) made the somewhat similar claim that for properties to be powers is for them to be truthmakers of an associated counterfactual conditional. Barker (2013) offers a criticism against this, which can be generalized into an argument against the idea that for something to be an R-power, it needs to be a truthmaker for dispositional sentences, law statements or modal/counterfactual truths. Realists and their foes allegedly disagree on physical reality and its constitution, what it encompasses and what it does not; any disagreement they might have on the truths concerning such reality, and any related truthmaking aspects, cannot be but derivative (perhaps this is just a consequence of the general maxim that truth supervenes on being). Thus one may want to reject the conclusion that, when realists and their foes debate, what it ultimately boils down to, is a disagreement on what accounts for truths in certain fragments of our language.

Trying to solve this dilemma would require too long a discussion. As of now, I feel the strength of both lines of argument and, honestly, am unsure how to proceed. For the time being, I reaffirm that for something to be a genuine power (an R-power), it needs to be a total ground for W-powers and nomic facts –and perhaps, a truthmaker for dispositional sentences and law statements as well. Which formulation is preferable, and why, I do not dare to say.

19. …and the road ahead

This mark of the dispositional is but a final step in the positive characterization of power realism that I struggled to achieve in the course of this thesis. I presented three possible sources of confusions in the formulation of the realist's claim –presenting three challenges for friends of powers. First of all, I wondered how exactly should the question of realism for powers be understood, and in which

[113] Ellis (2001: 128). Something similar is also stated in Molnar (2003: 199).

metaontological framework. Secondly, I wondered what dispositionality precisely is, in order to offer solid foundations for agreements and disagreements alike on powers. Thirdly, I wondered just how metaphysically revolutionary power realism really is.

Finally, after nine Chapters, we have some answers. By properly distinguishing between W-powers, M-powers and R-powers, we can formulate power realism as the claim that R-powers exist (R-realism); the mere acceptance of dispositional truths, viz. the acceptance of W-powers, is on the other hand not sufficient to be a power realist, and rather constitutes an ontologically innocent dispositional talk realists and antirealists alike can engage in. Genuine R-realism, on the other hand, suggests that disagreements between friends and foes of powers are ontological disagreements, even if the debate over the reality of powers is occasionally presented in other ways, e.g., a debate over the fundamentality of W-powers; or, as a debate over the nature or identity of properties, or again, over the semantics or truthmaking of dispositional sentences. How can these formulations be reconciled? Additionally, I introduced R-powers as properties bear a mark of the dispositional, viz., necessary and sufficient conditions for them being powers. But what can this mark be, for it to offer solid foundations for the whole debate?

The mark of the dispositional, introduced in this Chapter, nicely answers both questions. For according to it, for a property to be a genuine power, an R-power, it needs to be the total ground of some W-power. Under this relational grounding-based understanding of dispositionality, the claim on the reality of R-powers, can be either understood as an existence claim (about a certain stripe of properties playing some grounding roles), or as a metaphysical claim directly (about the holding of such grounding relations concerning W-powers). Because for something to be a genuine power, it has to be a total ground of some W-power, R-realism can equivalently be understood as a thesis about the grounding of W-powers instead: a realist takes W-powers to be wholly grounded in individual property instances, rather than properties and something else. An individual property instance is all the realist needs to make something so-and-so empowered. This recaptures the prominence of the question of realism for powers as a grounding question as described in Chapter 3. The "identity question", however, as we have seen, clearly takes a backseat.

In summary, the debate between friends and foes of powers is a debate on the reality of genuine powers, but also a debate about what it takes for something to be so-and-so empowered. According to my relational, grounding-based mark of the dispositional, and my distinction between W- and R-powers, I can make sense of both specifications, in a way that makes them fully compatible and complementary. And to ask whether the question of realism for powers is *really* an existence question or a grounding question, is, to my eyes, like asking whether the chicken or the egg came first. As we have seen in Chapter 3, there is some degree of convertibility between ontological questions (viz., questions of existence), and metaphysical questions (e.g., grounding questions); and there appears to be some liberty in the choice of the metaontological framework as well. I decided, for the reasons expressed in Chapter 2, to mostly work within the boundaries of Quinean metaontology; and thus, I prefer to characterize power realism as the claim that there are R-powers. That being said, I do not expect everyone to follow me in these choices.

The third question was: how metaphysically revolutionary power realism is, really? This is difficult issue to tackle. According to the mark of dispositionality that I proposed, the "applications" of power realism to the grounding of W-powers, laws of nature, and modality, are actually the beating heart of power realism. They *are* power realism. To accept powers in one's ontology is not, *per se*, to accept something with a specific intrinsic nature, and then claim that such things are able to perform certain metaphysical tasks. Rather, the crucial point of power realism is that, for the realists, how the objects

are empowered, and which the laws of nature are, depend not on any global distribution of properties throughout space-time, as some formulation of Humean Supervenience would dictate, and neither on any second-order self-sufficient structure of natural laws: it rather entirely depends on individual instances of properties. This makes any theory of powers *never* just a theory of properties.
That being said, there are realist positions that are more conservatives, and others that are more revolutionary. I could only explore some of these revolutionary aspects of power ontology. For our current purposes, the culprit here seems to be dispositional directionality, viz., the alleged relational bridge that pairs powers with their stimuli and manifestations; some conservative variants of realism (e.g., PQ) do not give directionality any metaphysical legitimacy; on the contrary, more revolutionary versions of realism (e.g., PP, at least in standard formulations) think that there is something deeply relational about objects and properties, in a way that would presumably force some revision in the background metaphysics.
An evaluation of the two positions throughout Chapters 6 to 8 has deemed both of them acceptable, and not subject to any knock-down counterarguments. Additionally, the choice between PP and PQ has never been deemed to be an exhaustive choice in the realist field –there is no argument to the conclusions that a power realist needs to either be a PPer or a PQer. In conclusion, exactly just how metaphysically revolutionary power realism really is, is not something that I can fully evaluate in this thesis. The choice between various versions of power realism force to take a stand on a number of different topics, from laws of nature, to causation, to modal ontology and semantics, to theories of properties and objects, to theories of change and persistence though time, and many, many more. To fully map these interactions is something far beyond the scope of this thesis. But now that power realism has been properly clarified, some step can be moved in the right direction.

That been said, what can this thesis tell us about future research on power ontologies? Of the many (many!) issues that I never resolved, there are two that appear of crucial importance. The first is about the hyperintensionality of power realism, and the second is about the Governing Challenge.
Firstly, it has not been recognized enough that in order to appreciate the difference between a world with powers and a world without powers –one needs to go hyperintensional. Consider, again PQ and Q-NEC; they are two very similar positions; but only in the first one, there are powers. The two positions are indistinguishable with merely modal or intensional tools. In what sense? According to both positions properties and W-powers (and similarly, properties and causal or nomic roles) are associated with the strength of metaphysical necessity. In short, according to both positions properties behave in the same way at all possible worlds. The possibility space of PQ and Q-NEC is no different. Therefore, no merely modal qualification of dispositionality is able to detect dispositionality in the PQer's world, while at the same time failing to detect it in the world of Q-NEC. Modally, they are the same. And yet, only in the first, and not in the second, there are powers. Therefore, we need something more; the grounding relation that I tentatively employed in the formulation of my mark of the dispositional is crucially hyperintensional in character: it is not sufficient for a property to be dispositional that it covaries necessarily with W-powers, nomic and causal roles. The latter must obtain *in virtue of* the former, for the property to be dispositional in the first place.
The hyperintensionality in our characterization of dispositionality can however be deeply problematic. For, as we have seen in Chapter 2, it is an open question whether hyperintensionality can be a metaphysically genuine phenomenon, or it only has representational or epistemic sources. In short, it is open question whether reality is finer-grained than modality. However, assuming power realists to be metaphysical realists in the sense provided in Chapter 2, when a power realist claims that there are

powers, she is supposedly making a claim about objective reality –and not about any representation of it (this is the second time this theme appears in this Chapter). And the difference between PQ and Q-NEC –viz., the difference between a world with powers, and one without– is supposedly not just a difference in the representation of the world, e.g., about how it is described or conceptualized. Powers are an objective matter. I concluded my discussion on hyperintensionality in Chapter 2 by abstaining from answering the difficult question: is there objective hyperintensionality? Yet it now appears that power realists have a dog in this fight. This is, in my opinion, a very real threat for any power realist who (like me) is also a metaphysical realist, and one that has not been properly addressed in the literature.

A second issue that warrants future research is the Governing Challenge. As claimed in Chapter 1, an explanation as how exactly powers can provide the world with natural necessities, and thus the correspondent regularities, is a requirement for every characterization of dispositionality. A world with powers is not anti-Humean in the sense that it has brute necessities, but in the sense that it has something (viz., powers) that enrich the world with necessities. The Governing Challenge calls for an explanation as to how exactly this enriching occurs. Remember that, as I have formulated the challenge in Chapter 1, power realists who accept that powers play a governing role, accept (some) true instances of schematic principles like

H) $\varphi^{D(S,M)}$ governs $\forall x(D_{(S,M)}x \rightarrow (Sx \rightarrow Mx))$,

and

O) $\Box(\varphi^{D(S,M)} \longrightarrow \forall x(D_{(S,M)}x \rightarrow (Sx \rightarrow Mx)))$.

Remember that, for some closed formula φ, φ^x refers to some fact that φ (which involves the power x). Which one, viz. which fact involving powers play a governing role (assuming it is a fact in the first place)? Until now, we were in no position to know, yet the suggestion was that perhaps some fact about the dispositional nature or character of properties could shed some light on this matter.

Are we in a position to say some more now? Can my mark of the dispositional clarify which fact $\varphi^{D(S,M)}$ we need to rise to the Governing Challenge? Unfortunately, the answer is no; the mark of dispositionality provided in this Chapter is constitutionally incapable of rising to the Governing Challenge. Why is that? According to it, something is a power if and only if it is a total ground for some W-powers, a law of nature, or perhaps some modalities relating to the power. Yet plugging this mark of the dispositional in **(G)**, in the place of $\varphi^{D(S,M)}$, gives underwhelming results. E.g., we may want to substitute $\varphi^{D(S,M)}$ for the fact that the disposition to M if S grounds the law according to which all Ss are M. This may be true, but it offers no explanation whatsoever as to why, in fact, all so-disposed things that are S, are also M; for there remains the issue as to why the power, *qua* ground for the law, is also governing. And similarly, it's not clear how considering genuine dispositional properties as the ground for W-powers, could shed any light as to how they play the governing roles they play. On the contrary, no step forward in the resolution of the Governing Challenge has been made: as it stands, this mark of the dispositional is little more than a statement that the challenge exists, rather than an answer to it.

This is a peculiar, yet fascinating, conclusion to reach. My mark of the dispositional has been offered as the minimal characterization of dispositionality, that everyone in the debate can accept –viz., a reasonable lowest common denominator of all power ontologies. Therefore, this conclusion suggests

that this minimal common ground on the character of dispositionality is not sufficient to explain how powers inform reality with a natural order.

By now it is pretty clear what power realism, understood as R-realism, is not. It is not a claim about the identity, nature, or internal make-up of properties; relatedly, power realism does not *per se* explain how powers provide the world with regularities: it merely declares that they do. It is easy to see how these two points are related; for one could think that an explanation of how powers enrich the world with regularities obtains in virtue of what powers are, what their nature is. But power realism, *qua* R-realism, does not dictate what this nature is, so it cannot explain how they enrich the world with regularities. In a way, power realism *qua* R-realism is little more than a program: it is not a departure from neo-Humean metaphysics, but merely an announcement thereof.

This is where the choice of words matters. Perhaps the word "announcement" or "declaration" should be substituted with the word "stipulation". I have introduced in Chapter 6 the idea that the Governing Challenge could be solved by way of stipulation; in a way, my mark of the dispositional could be read under a similar light, suggesting that the introduction of R-powers in one's ontology is unavoidably accompanied by the stipulation of appropriate "governing axioms", postulating that dispositional properties play grounding and explanatory roles. For there's no point in postulating something, without also stipulating what it is, and what it does. Any such "governing axiom" mind you, would need to be an instance of **(G)**, rather than **(N)**, for the postulation of powers must not be accompanied by the postulation of primitive necessities such as the ones expressed in **(N)**; introducing powers in one's ontology is on the contrary accompanied by the stipulation of some governing claims about facts involving powers on the one hand, and non-accidental regularities on the other. This solution closely resembles Schaffer's (2016) axiomatic dissolution of the inference problem that plagued nomological realism (as seen in Chapter 1, the two issues are close relatives); following Schaffer, one could simply claim that it is the business of powers, rather than laws, to govern, and that's the end of the story.[114]

I envision two problems for this solution. First of all, this is another instance in which, it seems to me, the difference between grounding and explanation (as introduced in Chapter 2) matters; for one may reasonably stipulate grounding relations, but hardly explanatory ones. Explanations, metaphysical or not, cannot be merely declared: they must be articulated –or, at least, outlined. To the extent in which the Governing Challenge is an explanatory challenge (e.g., "why necessarily water soluble things dissolve when immersed in water?"), powers cannot be postulated as providing explanations. Either the explanation is given, or the challenge is not met. Thus, perhaps, understood as an explanatory challenge, the Governing Challenge may not be as easily deflated as Schaffer (2016) would have wanted.

Secondly, as hinted at the end of Chapter 6, this may not be a methodologically advantageous move for the friend of powers, as it closes the debate altogether. The power realist may not want to just say "powers govern, and that's the end of it"; in general, *ceteris paribus*, providing more information is preferable to providing less. Another, and perhaps preferable thing to say, is that my mark of the dispositional (and perhaps, the governing axioms that one can use to tentatively introduce R-powers in one's ontology) does not exhaust a property's dispositionality, and thus does not preclude future enquiries. The Governing Challenge remains open; what power realists minimally agree upon (or at

[114] It is worth noticing that, while Schaffer's axiomatic solution envisions entailment axioms (from the law to the regularity), we will need something more substantial than that, given that proper governance, metaphysical grounding and/or explanation, is not merely entailment (even if presumably governance entails entailment). Schaffer (2016: 586) declares that the governing problem has been solved, but this only follows if one has a deflated understanding of governance as entailment (something that occasionally Schaffer seems to endorse).

least should agree upon), about the character of dispositionality, is but a stepping stone towards a deeper and more complete understanding of a world with powers. This is perhaps, as I have hinted in Chapter 6, where dispositional directionality could come into play again –and allow some versions of realism to score a point against others, with a more primitivist attitude towards dispositionality.

Yet, as crucial as it is for any friend of powers, the resolution of the Governing Challenge is the job for another time. As difficult as the challenge might be, this is good news for the friend of powers: for the literature on powers, dispositions, capacities and propensities, has often declared that a world with powers is something to be desired –yet the debate is only now starting to leave the programmatic stage. I hope, for one, that the content of this thesis will do its part in this exciting enterprise.

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