ARISTOTLE

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ARISTOTLE
METAPHYSICS
BOOK Θ

TRANSLATED WITH AN INTRODUCTION AND COMMENTARY BY

STEPHEN MAKIN

GENERAL EDITOR LINDSAY JUDSON

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Metaphysics

Book Θ

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with an Introduction
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For Cyril Makin
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PREFACE

This book has been quite some time in the writing, and many people have provided comments and assistance over the years. I would like to thank them all. Robert Wardy has given me detailed comments and invaluable advice on every aspect of the project. The book owes a great deal to him. Lindsay Judson has read numerous drafts, and his input has made this a better contribution to the Clarendon Aristotle series than it would otherwise have been. I have benefited greatly from the comments of Tad Brennan, Sarah Broadie, Myles Burnyeat, Nick Denyer, Kit Fine, Doug Hutchinson, Sean Kelsey, Stephen Menn, David Sedley and Charlotte Witt. I am extremely grateful to all these friends and colleagues.

Material from this book has been presented to the Aristotelian Society Joint Session, and to seminars at Cambridge, Nottingham and Sheffield. Many thanks for the questions and contributions of those audiences. I would also like to thank the students at Sheffield University who have attended and contributed to lecture courses on *Metaphysics Θ*.

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I spent the year 2003 on study leave, funded by the University of Sheffield and by the AHRB. During that year I thoroughly revised earlier partial drafts of the book, and I wrote material for those chapters which were then undrafted. By the end of 2003 I had my first complete version. In December 2003 my father passed away. He was a fine person. He gave me his unconditional and unstinting support throughout my life. This book is for him, in thanks for everything he ever did for me.

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INTRODUCTION

1. AN OVERVIEW OF *METAPHYSICS Θ*

In a way it is easy to state the aim of Aristotle's *Metaphysics Θ*. The book explores the distinction between actuality and potentiality, between being actually ϕ and being potentially ϕ, between the actual and the potential. Many difficult questions about the aim of *Θ* remain: for example, why Aristotle should want to investigate that distinction, and how *Θ* should be located within the *Metaphysics* as a whole. But it is both possible and useful to set out the main arrangement of material in *Θ* before turning to those difficulties.

The chapter breaks of *Metaphysics* are neither Aristotelian nor ancient. Chapter divisions did appear in some medieval Latin translations (both in manuscripts and in printings). However, there were sometimes alternative chapter divisions for the works that were arranged into chapters, and not all works in the corpus were so arranged. The Greek text of the entire corpus was first divided into chapters under the direction of Simon Grynaeus, in the third 'Erasmus' edition prepared under Grynaeus's direction in Basel in 1550 (so called because Erasmus was persuaded to write a preface). Grynaeus's motive was convenience of reference. In some cases he took chapter breaks over from previous Latin translations; in some cases he chose between alternative chapter divisions; and in the case of some texts, which had been unknown in medieval times, he introduced his own chapter structure. In the case of *Metaphysics* Grynaeus borrowed from Cardinal Bessarion's mid-fifteenth-century (1447–50) Latin translation of Aristotle's *Metaphysics*.

It is important not to overestimate the authority of the chapter divisions. However, they are not arbitrary (unlike, in this respect, the convenient line references, which correspond to the page, column, and line number of the text in Bekker's nineteenth-century edition of Aristotle: *Metaphysics Θ* runs from $1045^{b}27$ to $1052^{a}11$). The chapter breaks are intelligent and sensible, and mark out some striking broad divisions of the text. *Metaphysics Θ* is split into ten chapters, and these fall into three main parts:

1. Chapters 1–5;
2. Chapters 6–9;
3. Chapter 10.

Chapter 10 is about truth and falsity. It is tangential to the body of *Θ*. I will postpone further discussion of *Θ*10 until my detailed chapter comments. I concentrate for now on *Θ*1–9.

A division between Chapters 1–5 and 6–9 stands out on first reading the text, and reflects the structure Aristotle announces for *Θ* ($1045^{b}34$–$1046^{a}4$). The potentiality–actuality distinction is very general and of wide application. In the discussion of sensible substances in *Metaphysics* H it was connected with the pervasive form–matter distinction (*H*1, $1042^{a}27$–8; *H*2, $1042^{b}9$–11, $1043^{a}5$–7, $1043^{a}12$–28; *H*3, $1043^{a}29$–37; *H*5, $1044^{b}29$–$1045^{a}6$; *H*6, $1045^{a}23$–35, $1045^{b}16$–23). In *Metaphysics Λ*5 actuality and potentiality are said to provide some sort of common pattern of explanation applying to sensible substances ($1071^{a}3$–17). As *Metaphysics Λ* proceeds to non-sensible, indestructible, and unchangeable substances, form and matter drop out of the picture, and the argument is pursued in terms of potentiality–actuality (*Λ*6, $1071^{b}12$–$1072^{a}4$; *Λ*7, $1072^{a}24$–6, $1072^{a}30$–2, $1072^{b}13$–30). And potentiality–actuality turns up in *Metaphysics B*'s statement of abstract problems to be dealt with by first philosophy (*B*1, $996^{a}10$–11; *B*6, $1002^{b}32$–$1003^{a}5$).

Not all applications of the distinction are as abstract as these, however. For example, it is hard to understand what change is because it is hard to locate change within the potentiality–actuality dichotomy (*Phys.* 3.2, $201^{b}24$–$202^{a}3$); nevertheless, change can be defined in terms of actuality and potentiality (*Phys.* 3.1 *passim*, esp. $201^{a}27$–9), and the distinction could have been used to resolve Presocratic arguments that change is impossible (*Phys.* 1.8, $191^{b}27$–9). Potentiality and actuality are used in accounts of acting and being affected (*GC* 1.9), material combination (*GC* 1.10, $327^{b}22$–31), the soul (*An.* 2.1), and perception (*An.* 2.5).

The fact that Aristotle applies the potentiality–actuality distinction so broadly has three important consequences.

First, Aristotle is extending and developing the notions in using them so widely. For one side of the dichotomy he has to invent new terms (§4 on actuality, fulfilment); for the other he has to use existing terms in new ways (§3 on capacity, potentiality). Some

applications will be more familiar than others. That is why Aristotle starts in Chapters 1–5, with the clearest exemplar of potentiality–actuality, the relation between a capacity for change and the changes to which it gives rise (*Θ*1, 1045^{b}35–1046^{a}2). The more familiar and clear cases will elucidate the more novel and opaque instances of the potentiality–actuality distinction (*Θ*1, 1046^{a}2–4; *Θ*3, 1047^{a}30–1047^{b}2; *Θ*6, 1048^{a}25–30).

Secondly, even the more familiar capacity–change relation covers a huge range of cases. There are logical distinctions that are hard to mark without appropriate terminology (§3 on 'capable' and 'possible' as translations of the Greek adjective *dunaton*). And there are many different types of capacity: active and passive, one way and two way, non-rational and rational, innate and acquired, those acquired by learning and those acquired by practice. Aristotle needs to bring order to this material if he is to have any hope of reaching interesting conclusions about the more familiar capacity–change relation.

Thirdly, if the capacity–change relation is to serve as a clear case, then it has to be a secure case too. If doubt can be cast on what are supposed to be the clearest cases of the potentiality–actuality distinction—for example, on the viability of the distinction between and someone capable of building but not presently doing so and someone actually building—then those cases will be useless as a way into the more difficult applications—for example, form and matter.

Those three consequences shape the main blocks of material in the first part of *Metaphysics Θ*, Chapters 1–5.

*Θ*1 Aristotle explains the structure of the discussion to come, and the reason for focusing initially on the capacity–change relation (1045^{b}32–1046^{a}4). The discussion of capacities starts with the exclusion of marginal cases (1046^{a}6–9).

A wide variety of types of capacity are analysed by identifying the active capacity of an agent to bring about a change in something else as the central case (1046^{a}9–11), and connecting all the other cases to that one (1046^{a}11–19). There is a careful account of the distinction between an active capacity and the most significant secondary case of a passive capacity (1046^{a}19–29).

*Θ*2 Aristotle prepares for the account in *Θ*5 of the relation between active and passive capacities, on the one hand, and the changes to which they give rise, on the other.

Two distinctions are presented: non-rational versus rational capacities ($1046^{a}36–1046^{b}4$), and one-way versus two-way capacities ($1046^{b}4–7$). Aristotle argues that those two distinctions align with one another ($1046^{b}4–15$).

He makes correlative points about agents that possess the different types of capacity ($1046^{b}15–24$).

*Θ*3 Aristotle argues against the deflationary view that there is no genuine capacity–change distinction: that agents never possess unexercised capacities ($1046^{b}29–1047^{a}29$).

If that deflationary view is false, there is a genuine distinction between what an agent is capable of and what it is actually doing, and more generally between what is possible and what is actual ($1047^{a}17–24$). So Aristotle provides a way of establishing whether something is possible ($1047^{a}24–9$).

*Θ*4 The distinction between what is possible and what is actual is further vindicated by showing that there is also a genuine difference within what is non-actual between the possible and the impossible ($1047^{b}3–14$).

*Θ*5 General conclusions are established about the capacity–change relation. As regards one-way capacities: necessarily if agent and patient are in the right condition and related in the right way, then action results ($1047^{b}35–1048^{a}7$). As regards two-way capacities: necessarily if agent and patient are in the right condition and related in the right way, and the agent chooses to act, then action results ($1048^{a}7–15$).

These general conclusions are further explored and bolstered ($1048^{a}15–24$).

The first part of *Metaphysics Θ* establishes important conclusions about the capacity–change relation. Since agents still possess capacities even when they are not exercising them, the capacity–change relation exemplifies a real difference between potentiality and actuality. But capacities inevitably and necessarily give rise to changes in the right circumstances. That fact about the capacity–change relation is of great significance in the second part of *Metaphysics Θ*, where what is at issue is the potentiality–actuality distinction conceived more generally: it underpins the conclusions in the latter parts of *Θ*8 about the priority of actuality over potentiality (*Θ*8, $1050^{a}4–1050^{b}6$, $1050^{b}6–1051^{a}3$).

Before turning to *Θ*6–9, notice that the outline of Chapters 1–5 above does not cover the complete text. There are a number of passages in *Θ* that do not integrate well with their immediate context. With one notable exception in the second part of *Θ* (*Θ*6, 1048^{b}18–35), there is absolutely no reason to be suspicious of their textual status. Such passages are often found immediately preceding the Bessarion/Grynaeus chapter breaks. At the end of Chapter 1 there is a summary comment on different types of incapacity (1046^{a}29–31), leading on to some remarks on privation (1046^{a}31–5). Chapter 2 closes with some remarks on the relation between the capacity for doing something well and the capacity for doing something *simpliciter* (1046^{b}24–8). At the end of Chapter 3 there is a passage concerning the extension of the term *actuality* from its original application, leading to some comments on the status of what-is-not (1047^{a}30–1047^{b}2). And more than half of Chapter 4 is devoted to arguing for two related modal theses (1047^{b}14–30). Similarly peripheral passages are found in Chapters 6–9. These passages are invariably interesting in their own right, and are sometimes extremely important.

The second part of *Θ*, Chapters 6–9, extends the discussion in Chapters 1–5 of the clearest exemplar of the potentiality–actuality distinction (that is, capacity–change). The aim is to make headway with the more opaque applications. These extended applications are the main concern of *Θ* (*Θ*1, 1045^{b}36–1046^{a}1; *Θ*6, 1048^{a}28–30). Aristotle has to tread a careful path. On the one hand, the same potentiality–actuality distinction is exemplified in the capacity–change and matter–substance relations (*Θ*6, 1048^{b}4–6): that is why Chapters 1–5 can serve as preparation for Chapters 6–9. On the other hand, the two types of case are very different exemplifications (*Θ*6, 1048^{b}6–9): that is why the second is an extension beyond the first, and why Chapters 6–9 need Chapters 1–5 as preparation. The way in which the capacity–change case exemplifies the distinction of the potential and the actual is quite different from the way in which the matter–substance case manifests that same distinction.

The main blocks of material in the second part of *Metaphysics Θ* are arranged as follows:

*Θ*6 Aristotle rehearses the reasons for starting with a discussion of the capacity–change case (1048^{a}25–30).

There are two attempts to elucidate the general potentiality–actuality distinction ($1048^a30–5$, $1048^a35–1048^b4$). The second is more successful than the first, because there Aristotle lays out different cases side by side and invites us to see the analogies between them. He also comments explicitly on the respect in which the two types of case (capacity–change, matter–substance) do exemplify a single general pattern ($1048^b4–9$).

*Θ*7 Having introduced the general potentiality–actuality distinction, Aristotle can clarify its new and difficult applications through consideration of a specific question: under what conditions is something potentially (F). He again cites the parallels between the extended applications and the more familiar capacity–change case ($1048^b37–1049^a5$).

Aristotle's position ($1049^a5–18$) is that something is potentially F so long as it is a suitable starting point for the production of something actually F by means of some appropriate capacity. He details three cases: rational capacities ($1049^a5–11$), capacities for change more generally ($1049^a11–12$), and natures ($1049^a13–18$).

It follows that the (immediate) matter of an F is potentially an F. This is an important result. Aristotle bolsters it by appeal to some linguistic data ($1049^a18–24$), and draws some corollaries ($1049^a24–1049^b2$).

*Θ*8 This is the longest chapter of *Θ*. It builds on *Θ*5 (the capacity–change relation) and *Θ*6–7 (the extended application that takes in the matter–substance relation) to explain a general feature of the potentiality–actuality distinction. The wide variety of cases covered by the discussion is emphasized throughout ($1049^b4–10$ both capacities for change and natures; $1050^a15–23$ matter and form; $1050^b6–1051^a3$ perishable and eternal things).

Actuality is prior to potentiality (1049^b5). Three types of priority are considered: priority in account, in time, and in substance ($1049^b10–12$: what these come to is fairly clear in the first two cases, but not in the third).

What is actually F is prior in account to what is potentially F ($1049^b12–17$).

What is actually F is in one way temporally prior to what is potentially F, and in another way temporally posterior ($1049^{b}17–1050^{a}3$).

The bulk of the chapter concerns priority in substance ($1050^{a}4–1051^{a}2$). Two types of case are considered ($1050^{a}4–1050^{b}6$, $1050^{b}6–1051^{a}2$).

In the first type of case the items that are actually and potentially F are perishable items from within the natural world. The substantial priority of what is actually F over what is potentially F is exhibited in the relation of: mature to immature specimens ($1050^{a}4–9$); something's exercising a capacity to its possessing that capacity ($1050^{a}9–14$); substance to matter ($1050^{a}15–23$); and exercise to capacity ($1050^{a}23–1050^{b}2$).

In the second type of case ($1050^{b}6–1051^{a}2$) the items that are actually F are eternal things (for example, the sun and stars), those that are potentially F are destructible things.

*Θ*9 The priority of what is actually F is reinforced first in evaluative, and second in epistemic, terms.

In evaluative terms: if a capacity to ϕ is a good capacity, then actual ϕ-ing is better than inactive possession of the capacity to ϕ ($1051^{a}4–15$); and, if the capacity to ϕ is a bad capacity, then actual ϕ-ing is worse than inactive possession of the capacity to ϕ ($1051^{a}15–21$).

In epistemic terms: geometrical proof proceeds by actualizing, and thereby making apparent, constructions that had been potential ($1051^{a}21–33$).

The main omissions from the outline of *Θ*6–9 above are two blocks of material from *Θ*6. One is of lesser importance: $1048^{b}9–17$ concerns the status of the infinite and the void. But the second is of much greater significance, and its absence from the outline of *Θ*6–9 is far more striking. The passage $1048^{b}18–35$ introduces a well-known Aristotelian distinction between incomplete and complete changes. Incomplete changes are directed to a result beyond themselves and are incomplete until that result is achieved (as house building is directed towards houses, and walking to being in a certain location). In contrast, a complete change is not directed to a distinct result,

and is complete at any and every point (as seeing does not require a result outside itself to finish it off). This distinction is, in itself, both interesting and important. What is not clear is how significant it is for the overall argument of *Metaphysics Θ*. One main reason why that is not clear is that the textual status of $1048^{b}18–35$ is controversial. There is more detailed discussion at Commentary, Chapter 6, §§6, 7.

Another introductory point. Throughout this Commentary I talk about the relation both between a capacity and *a change* and between a capacity and *its exercise*. This is deliberate, and should not mislead. There is an important difference between the *exercise* of a capacity and the *exercising* of a capacity. I say very little about the latter notion. The *exercising* of a capacity is the transition from its inactive possession to its active exercise. The metaphysical status of this *exercising* is opaque. I do not mean to suggest that the *exercising* of a capacity is a change, and I think it unlikely that Aristotle believed that it was (see Commentary, Chapter 6, §7, on Aristotle's discussion at *An.* 2.5, $417^{a}21–417^{b}6$, of the difference between two types of transition: in terms of the distinction explained there, it is likely that the *exercising* of a capacity will be an example of the second type of transition in which the potential is preserved in, rather than being replaced by, the actual). By contrast, the *exercise* of a capacity is not the transition from the inactive possession of a capacity to anything at all—it is, rather, that to which there is a transition. Why not simply use the term *change* for that item? There are two main reasons. First, it is not just any old change that is relevant in a particular case. Maybe when a fire starts to heat oil all sorts of changes occur in the oil (for example, changes of colour and viscosity). It is not those changes that stand to the fire's capacity to heat as the actual to the potential, but rather the rise in temperature in the oil: that is to say, the change that is associated in a certain way with the capacity—namely, in virtue of being its *exercise*. Second, Aristotle will mention cases in which it will be awkward to talk of the exercise of a capacity as a change (*Θ*5, $1047^{b}32$, the capacity to play the flute: the exercise of that capacity is flute playing, but it is not clear that flute playing is a change—and it would beg too many questions to assume that the distinction at *Θ*6, $1048^{b}18–35$, can be wheeled in throughout *Metaphysics Θ*). For both these reasons it will sometimes be very helpful to talk of the *exercise* of a capacity.

2. HOW TO READ *METAPHYSICS Θ*

Aristotle's *Metaphysics*, as it has come down to us, consists of fourteen books. The orthodoxy is that it is the product of some sort of editorial work on treatises that were originally distinct, although authoritative ancient evidence on this editing is surprisingly scanty (Menn 1995). There is considerable disagreement about the chronological and logical relations between the different books. Some of the books seem self-contained, and are prime contenders for intruder status into the *Metaphysics* as we have it now: most notably *α*, *Δ*, and *K*. Others fall into more natural sequences, although details are disputed. It is commonly agreed that *Θ* is not an independent treatise. But, since there is no agreement on the structure of the books within which it is embedded, a commentary devoted to *Θ* faces a pervasive difficulty.

The details of *Θ*'s internal structure are difficult. Given that, a good way to proceed would be to follow guiding lines of argument in steering a path through *Θ*. Since *Θ* does not stand alone, those lines of argument are certain to integrate *Θ* somehow with surrounding books. But any substantive account of how the other books of the *Metaphysics* are related to one another will be controversial, while any account that avoids controversy by avoiding bold claims will fail to provide real help with the opaque internal structure of *Θ*.

So it might be better if we could be guided by lines of argument that start at the beginning of *Θ* itself. There would still be disagreement on how to fit in the books that are downstream of *Θ*, but there is no reason why those questions should be decided in a commentary on *Θ*. That is the sort of position we are in with the notoriously difficult book *Z*. While *Z* has connections with other books of the *Metaphysics*, *Z* 1–2 seem to explain and introduce a fairly large-scale project. However, the case of *Θ* is different. It has to be understood, at least to some degree, in the light of questions set by a project already under way when the book starts.

So how should a commentary on *Θ* proceed? One option would be to outline the leading candidate accounts of the overall structure of the *Metaphysics*, explain in detail how individual chapters of *Θ* would be understood differently in the light of different accounts, and maintain a studied neutrality throughout. But that would turn this commentary into a catalogue of possibilities, whereas the hope

is genuinely to engage with, rather than just describe different ways in which one *could* engage with, the arguments of *Θ*.

Another option would be to adopt one's favoured account without argument, ignore its problems and the alternative candidates, and get started at the first sentence. But that would give a false impression of the difficulties of interpreting *Θ*, and in the eyes of some readers would beg too many important questions.

A third option would be simultaneously to rely on and defend an account of the main lines of argument that structure *Θ*. But, since *Θ* is not the start of the overall argument, a commentary on *Θ* itself is not the place to start the defence of one guiding argument over another.

It is good for a reader to be aware of these issues before approaching the text. All I will do here is describe in broad outline some different ways of relating *Θ* to the immediately surrounding book of the *Metaphysics*. As Aristotle says, it helps to be aware of the difficulties of a project before embarking on it (*Metaphysics B*1, $995^{a}27–995^{b}4$).

One perspective on *Metaphysics Θ* is the following. The concern of the *Metaphysics* is *being* or *what is*. But, as Aristotle repeatedly remarks, 'being is said in many ways'. There is a brief and programmatic classification at *Metaphysics Δ*7 (see Kirwan 1971 for further comment). Things are said to be

1. $1017^{a}8–22$: accidentally;
2. $1017^{a}22–30$: in their own right, as indicated by the different categories;
3. $1017^{a}31–5$: in that they are true or false;
4. $1017^{a}35–1017^{b}9$: in that they are potentially and actually.

*Metaphysics E*1 is a difficult discussion of the nature of first or primary philosophy, which will study being qua being—what it is, and the attributes that belong to it qua being (*E*1, $1026^{a}31–2$). The fourfold classification of *Metaphysics Δ*7 then reappears at the start of *Metaphysics E*2 (*E*2, $1026^{a}33–1026^{b}2$). So one might expect any study of being (whatever that study turns out to be) to follow four lines of enquiry corresponding to the fourfold classification. Those four lines would be pursued though *Metaphysics E–Θ* as follows:

1. *Metaphysics E* 2–3: accidental being;
2. *Metaphysics Z–H*: categorial being (with the emphasis on the primary category, substance);
3. *Metaphysics E* 4, *Θ* 10: being as truth and falsity;
4. *Metaphysics Θ* 1–9: being potentially and actually.

On this approach *Θ* would be the start of a local line of enquiry that was itself one of a broader set of enquiries within the grander project of the *Metaphysics*.

A second perspective concentrates on *Θ* as contributing to the resolution of problems bequeathed it from elsewhere, most notably the immediately preceding books *Z* and *H*. *Metaphysics Z* poses the question 'what is substance?' (*Z* 1, $1028^{b}2$–4). In the course of the complex discussion in *Z* and the following book *H*, a number of conditions on something's being a substance are identified. One of these is that a substance should be a unity, rather than a collection of other things. But it also emerges that concrete individuals—which, at the very least, have a strong claim to be substances—are complexes, for example of form and matter. Aristotle's treatment of this issue in *Metaphysics H* 6 turns, in one way or another, on connecting form with actuality and matter with potentiality, and referring the unity of form and matter to the unity of actuality and potentiality (for more detailed discussion, see §6 below). But clarifying issues concerning form and matter in terms of actuality and potentiality incurs a further cost. Aristotle now has to clarify the notions of actuality and potentiality, and in ways that show how they can fulfil the dialectical task set them. On this approach an important concern in *Metaphysics Θ* will be to show how it is that form and actuality, and matter and potentiality, are connected, and how the unity of the actual and the potential is any more perspicuous than the unity of form and matter that it is intended to explain.

These two are not the only ways of connecting *Θ* with other books of the *Metaphysics* (see Frede 1994: 174–6 for discussion). For example, *Θ* has looser connections with the problems raised in *Metaphysics B* (see *B* 1, $996^{a}10$–11; *B* 6, $1002^{b}32$–$1003^{a}5$; Madigan 1999 for comment). And the notions of actuality and potentiality that are the subject of *Θ* are important for the project of *Metaphysics Λ*.

Later in this Introduction (§§6, 7) I will outline two sets of problems to which *Metaphysics Θ* contributes. One concerns issues about the unity of substance, inherited from *Metaphysics H*. The

other focuses on the metaphysical project Aristotle pursues in *Metaphysics Λ*. In both cases the aim is to motivate these problems for readers who are not predisposed to be interested in Aristotle, and to give those readers a way into *Θ*. I hope I can pursue that aim while finessing intractable questions about the place of *Θ* in the *Metaphysics*.

3. ARISTOTLE'S MODAL TERMINOLOGY (1): POSSIBILITY AND CAPACITY

At the core of *Metaphysics Θ* is the contrast between potentiality and actuality. It is important to say something about the modal terminology Aristotle has at his disposal to express and discuss that contrast. The overview in §1 simplified matters considerably. As regards the potentiality side of the contrast, Aristotle's vocabulary is limited. As regards the actuality side, ordinary Greek was even more inadequate, and Aristotle invented two new words, whose relation to one another calls for comment.

First, the potentiality terminology. Aristotle uses three related Greek terms in *Metaphysics Θ*:

1. a verb *dunasthai*;
2. a noun *dunamis*;
3. an adjective *dunaton*.

A translator's ideal might seem to be a same-Greek/same-English strategy throughout *Metaphysics Θ*, which also preserves the relation between noun, verb, and adjective. Failing that, a strategy that permits same-Greek/different-English across *Θ* as a whole, but preserves same-Greek/same-English within as large sub-*Θ* units as possible, would be attractive. Any decision to translate a single Greek term by different English terms within small bodies of text requires justification.

1. The verb is less common than the noun or adjective, and the uniform translation 'to be capable' is attractive. But a corresponding uniform translation for the noun ('capacity') and adjective ('capable') is not feasible.

2. The noun is used in both the nominative (*dunamis*) and the dative (*dunamei*) case. When used in the nominative, it can often

be translated as 'capacity'. For example, an electric kettle has a capacity (*dunamis*) to heat water, and medical skill is a two-way capacity (*dunamis*) possessed by a doctor to heal or harm patients. However, the noun is also used in the dative case with adverbial force. There is no natural rendition in terms of *capacity*, and translators have generally opted for *potentially*. For example, we might ask whether a fertilized egg or a viable foetus is potentially (*dunamei*) a human being, and what conditions are required for something to be potentially (*dunamei*) a house.

Now the dative *dunamei* is far more common in the second part of *Θ* than in the first. It occurs twenty-three times in Chapters 6–9, but only three times in Chapters 1–5 (*Θ*1, 1046^{a}30; *Θ*2, 1046^{b}25; *Θ*3, 1047^{b}1). Since the dative *dunamei* is naturally translated 'potentially', and since the dative predominates in the later chapters of *Θ*, it is reasonable to translate the corresponding nominative *dunamis* by 'potentiality' in those later chapters (for example, *Θ*8 would be about the relation between potentiality (*dunamis*) and actuality (*energeia*)).

However, it would not be wise to favour 'potentiality' over 'capacity' as a rendition of the nominative *dunamis* in the earlier chapters of *Θ*. It would be unnecessarily opaque (for example, the opening of *Θ*5, 1047^{b}31–2, would read 'as all potentialities are either innate ... or come about by habit ... or by learning'); and it would miss the contrast with the negative term at *Θ*1, 1046^{a}29–35 ('capacity' and 'incapacity' have no equivalent in terms of 'potentiality').

So the norm is that the noun *dunamis* will be translated 'capacity' in *Θ*1–5 and 'potentiality' (nominative), 'potentially' (dative) in *Θ*6–10. The advantage is a high degree of uniformity across very large sub-*Θ* blocks of text (*Θ*1–5, *Θ*6–10).

However, the uniformity is not total. Aristotle starts *Θ*1 with some organizational remarks (1045^{b}27–1046^{a}9). Only then does he introduce and define the core notion of an active capacity (1046^{a}10–11). Prior to his doing so it would be misleading to use the translation 'capacity'. So I use 'potentiality' for the noun *dunamis* at 1045^{b}33–5, 1046^{a}1, 5–6 (with 'being potential' for the verb *dunasthai* at 1046^{a}5, 'possible/impossible' for the adjectives *dunata* and *adunata* at 1046^{a}8). Another departure is the translation 'potentially' for the adverbial dative at *Θ*3, 1047^{b}1: this is in the course of a discussion of actuality, in one of the passages

that is not well integrated with the material that surrounds it. A third departure is at *Θ*9, 1051^{a}8, 'the same capacity', where Aristotle is making a point about the type of active and passive capacities that were the subject of *Θ*1. Further, the high degree of uniformity that is secured comes at the cost of a few dissonant translations. The decision to translate the noun *dunamis* as 'capacity' throughout *Θ*1–5 causes strain at *Θ*3, 1047^{a}25, and *Θ*5, 1048^{a}15–16 (see Commentary, Chapter 3, §8, and Chapter 5, §10); and the decision to translate *dunamis* as 'potentiality' in *Θ*6–10 produces jarring results at *Θ*6, 1048^{b}8 (see Commentary, Chapter 6, §2).

3. Translation of the adjective *dunaton* (and the cognate negative adjective *adunaton*) raises a different issue. This does not turn particularly on the transition between Chapters 1–5 and 6–9. Throughout *Θ* the translations 'capable/incapable' are tempting at some places, and 'possible/impossible' at others. There is no uniformity across any very large sub-*Θ* blocks of text. The choice between '(im)possible' and '(in)capable' does not map onto the large-scale structure of *Θ*. It is, rather, a choice recommended by charity.

First what *is* the distinction between the (im)possible and the (in)capable? Start with the rough though intuitive idea of that very wide range of weak modalities, which includes abilities, capacities, epistemic licences, ethical permissions, logical possibilities, physical possibilities, powers, skills, temporal possibilities, tendencies, and so on. For convenience sake, and by fiat, I will use the term *can* neutrally to cover this range of cases (I can play the piano, I can believe that Princip shot Archduke Ferdinand, we can lie to save the innocent, sulphuric acid can dissolve zinc, etc.). These are *weak* modalities because the fact that I can ϕ does not entail that I do ϕ (I can play the piano but I am not doing so; I can believe that Princip shot Ferdinand, but I do not).

Now consider this principle:

[T] A ϕs → A can ϕ

We can divide the very wide range of weak modalities between those for which [T] does and those for which [T] does not hold. For example, [T] holds for physical possibilities or temporal possibilities (if the ball is moving at 30 mph then it physically can move at 30 mph,

if it will rain tomorrow then it temporally can rain tomorrow). [T] does not hold for epistemic licences or ethical permissions (I do believe the Earth is flat, but it is not something I epistemically can believe, namely, given the evidence; I do divert departmental funds to my bank account, but that is not something I ethically can do).

Most significantly for present purposes, [T] does *not* hold of capacities (I do get the wall to stay up, but I do not have the builder's capacity to erect walls—I have succeeded by luck; pouring the acid onto the zinc plate does produce striking circular etchings, but that is not the capacity this acid possesses vis-à-vis zinc—rather, that is how the capacity to dissolve zinc happened to work out in this case). In contrast, [T] *does* hold of that generic notion of possibility, of which logical, physical, and temporal possibilities are species. So the distinction between 'capacity' and 'possibility' is best understood by reference to [T]. For brevity I will call weak modalities that obey [T]—such as possibility—'standard' modalities, and those which do not—such as capacity—'non-standard'.

Secondly, what reason is there to suppose that there is any distinction within Aristotle's own use of the adjectives *dunaton*/*adunaton*, which might *prima facie* be marked by the contrast between 'capable/incapable' and 'possible/impossible'? It helps here to refer to Aristotle's discussion of *dunamis* in *Metaphysics* Δ12, which has the following structure. First of all four different notions are discussed:

(*a*) the positive noun *dunamis* ($1019^{a}15$–32);
(*b*) the positive adjective *dunaton* ($1019^{a}32$–$1019^{b}15$);
(*c*) the negative noun *adunamia* ($1019^{b}15$–21);
(*d*) the negative adjective *adunaton* ($1019^{b}21$–2).

There then follows a distinction between *all* the preceding and another sense of *dunaton*/*adunaton* ($1019^{b}21$–3). It is just this latter distinction that translators of Δ typically mark by switching from 'capacity' and cognates to 'possibility' and cognates. But, since Aristotle does not have such distinct terms available, he summarizes the contrast in a different, though perfectly clear, way at $1019^{b}34$–5: it is the contrast between what is *dunaton* in accordance with a *dunamis* and what is *dunaton* not in accordance with a *dunamis*.

This contrast, between what is and what is not *dunaton* in accordance with a *dunamis*, is one we should expect to find in *Θ*. Further, it is one that it would be reasonable to mark in translation by the 'capable/possible' distinction, as that distinction has been explained above. On the one hand, the modality to which Aristotle refers as *dunaton* not in accordance with a *dunamis* should be taken as a standard modality. Notice the three types of what is *dunaton* not in accordance with a *dunamis* that he provides in *Metaphysics Δ*12: what is not of necessity false, what is true, and what can be true ($1019^{b}30–3$). If something is actually the case, it is obvious that it will be possible in these senses, and therefore that these give us types of standard modality. On the other hand, the modality that Aristotle characterizes as *dunaton* in accordance with a *dunamis* should be treated as a non-standard modality. There are two reasons. First, according to *Θ*5, $1047^{b}32–4$, a *dunamis* that arises by habit (for example, flute playing) or by learning (for example, weaving) needs to be acquired through previous exercise. So there can be instances of flute playing or weaving that are not exercises of the relevant *dunamis*, and that do not entail that the agent has the relevant *dunamis*. Therefore these instances cannot be *dunaton* for the agent in accordance with a *dunamis*. Secondly, Aristotle holds that appeal to a *dunamis* is explanatory (*Metaphysics Δ*12, $1020^{a}1–2$; *Θ*1, $1046^{a}10–11$—a *dunamis* is an origin of change). However, if what is *dunaton* in accordance with a *dunamis* were treated as a standard modality, it is hard to see how appeal to a *dunamis* could be explanatory, since in that case the occurrence of the change to be explained would entail the existence of the *dunamis*.

The consequence for my translation is that the adjective *dunaton* will sometimes be translated 'capable', sometimes 'possible' (with occurrences at *Θ*6, $1048^{a}27$, 28 as '(the) potential'). The choice of translation at a particular place will reflect whether the modality is being treated as standard or non-standard in the passage in question. Since whether the modality is standard or non-standard will not be explicitly stated in the text, a decision will often be made on the grounds of charity: namely, whether a standard or non-standard reading of the modality is required in order to give a good argument or reading of the passage. Since 'capable' marks a non-standard modality while 'possible' marks a standard modality, and since the non-standard/standard distinction captures the

distinction drawn in *Metaphysics* Δ12 between what is *dunaton* in accord with a *dumanis* and what is *dunaton* not in accord with a *dunamis*, it follows that, if A is capable of ϕ-ing, then A has the capacity (*dunamis*) to ϕ. By contrast, if it is possible for A to ϕ, then A may or may not have the capacity (*dumanis*) to ϕ: for, if A does ϕ, then it is possible that A ϕ's, and someone's ϕ-ing is consistent both with her lacking the capacity to ϕ (she is learning and practising) and with her possessing the capacity to ϕ (she is a skilled master ϕ-er demonstrating the art for her pupils).

It is important to flag the difference between what something is capable of doing, and what it is possible for something to do. In Θ3 Aristotle provides a test for something's being *dunaton* ($1047^{a}24$–6). Translation will be decided by considering whether the test defines a standard or a non-standard modality (Commentary, Chapter 3, §8, will argue that it defines a standard modality). A further question (see Commentary, Chapter 3, §9) will be whether the test characterizes just one type of possibility (for example, broadly logical possibility) or not. That discussion will feed into a topic that is important in Θ5: the way in which the conditions in which an agent and patient are located may render it possible or impossible for the capacities they possess to be exercised (Commentary, Chapter 5, §§10–12). The material from Θ5 is of significance for understanding the argument in Θ8, $1050^{a}4$–$1050^{b}6$, that actuality is prior in substance to potentiality (Commentary, Chapter 8, §§6–9), and that is one of the major results of Θ as a whole. In working through this material later one must be sensitive to the way in which the English terms *(im)possible* and *(in)capable* reflect considerations of argumentative charity.

4. ARISTOTLE'S MODAL TERMINOLOGY (2): ACTUALITY AND FULFILMENT

The situation as regards the other side of the modal contrast is much more complex. The main term to consider is a noun *energeia*. As with the noun *dunamis*, this occurs in both the nominative case (*energeia*) and the dative (*energeiai*) when it has adverbial force. I have adopted the translation 'actuality' for the nominative and 'actually' for the dative—the latter is parallel to the translation

'potentially' for the dative *dumanei*. The dative (adverbial) occurrences are the less common (*Θ*3, 1047^{a}35, 1047^{b}1; *Θ*6, 1048^{a}35, 1048^{b}6, 10–11, 15; *Θ*8, 1049^{b}22, 24, 27, 1050^{a}16).

However, while *dunamis* is a term of ordinary Greek, *energeia* is coined by Aristotle. Further, there is another word, *entelecheia*, also invented by Aristotle, whose relation to *energeia* is controversial. The term *entelecheia* is rare in *Metaphysics Θ* (six occurrences: *Θ*1, 1045^{b}33–4, 1045^{b}35; *Θ*3, 1047^{a}30, 1047^{b}2; *Θ*7, 1049^{a}5–6; *Θ*8, 1050^{a}23). I have translated it as *fulfilment* (or *in fulfilment* for the datives at *Θ*3, 1047^{b}2, and *Θ*7, 1049^{a}5–6). But that translation is little more than a convention adopted to flag those rare occurrences of *entelecheia* as opposed to *energeia*. There is considerable disagreement about the etymologies of both *energeia* and *entelecheia*, about the development of Aristotle's use of the terms, their relation to one another, and their precise meaning (for a selection on these controversies, see: Blair 1967, 1992, 1993, 1995; Graham 1987, 1989, 1995; Menn 1994).

Energeia is the earlier neologism. It is found in one of Aristotle's earliest works the *Protrepticus*, and means 'activity'. Aristotle is led to the term through reflection on an earlier Platonic distinction between possession and use (*Euthydemus* 280b–282a; *Theaetetus* 197a onwards). Aristotle coins a new term because the terms of ordinary Greek already available to him each have their own misleading and restrictive connotations. There is dispute about the etymology of *energeia*. All agree that it derives from some *erg-* root, though there is disagreement on whether the formation is from the rare active verb *ergein* or from the adjective *energos* (see, for example, Blair 1992: 17–20). Aristotle refers to the fact that the original sense of *energeia* is *activity* in *Metaphysics Θ* (*Θ*1, 1046^{a}1–2; *Θ*3, 1047^{a}30–2).

Energeia does originally cover a broad range of cases, the exercise of any of a wide range of powers or capacities. However, it does not originally cover something's existing actually, as exercising a previously unexercised power to exist. At some point Aristotle was prompted to introduce a new notion which could not easily be expressed by the term *energeia* as initially coined. Stephen Menn directs attention to *An.* 2.1. A standard example of the distinction between a power (*dunamis*) and its exercise (*energeia*) in the early Aristotle was that of possessing knowledge and using knowledge (*Protrepticus* B78,

EE 2.9, 1225^{b}11–12, *Magna Moralia* 2.6, 1201^{b}10–12; the example occurs in Plato, *Euthydemus* 277e–278a, *Theaetetus* 199a). At *An.* 2.1 Aristotle wants to say that the soul is an actuality of the body (since an ensouled body is a body which is actually alive); but there are different notions of actuality and one of them will correspond to *possessing* knowledge rather than using it—for it is clear that the sleeping mathematician, who possesses but is not using her mathematical knowledge, is nevertheless alive (*An.* 2.1, 412^{a}22–7). Now it will not be easy for Aristotle to make this point using the term *energeia*. For *energeia* originally corresponded to knowledge *use*, while knowledge *possession* was a paradigm example of *dunamis*. What Aristotle in fact does in the *de Anima* discussion is use the new term *entelecheia*. For example, at *An.* 2.1, 412^{a}21–3, he says that *entelecheia* is used in two ways, one corresponding to knowledge possession and one to use. It would grate with the original introduction of *energeia* to say that there is a sense of *energeia* corresponding to the possession rather than use of knowledge: and Aristotle usually avoids saying that the soul is the *energeia* of the body (the exceptions are *An.* 3.4, 429^{b}6–7, and *Met. H* 3, 1043^{a}35–6).

Although the etymology of *entelecheia* is disputed, it is clear that—unlike *energeia*—it does not have its roots in the notion of activity (*erg-*). Aristotle says at *Met. Θ*8, 1050^{a}21–3, that the neologism is derived from the term *telos* (end or goal): in that case it must mean something like 'having its end within itself' (*en* (*heautôi*) *telos echein* (Blair 1992: 79–82, and Menn 1994: 100–1, who also cites *Met. Δ*16, 1021^{b}24–30 as relevant)). But this etymology has been challenged: the alternative is that the derivation is from the neuter adjective *enteles* (complete, full or perfect) and means 'having completeness', 'being complete' ((*to*) *enteles echein* (Graham 1987, 183–5; 1989)). Etymology aside, however, such rebarbative phrases as 'having an end within itself' are unsatisfactory as translations. An appealing strategy would be to translate *entelecheia* as 'actuality', in contrast to *energeia* translated as 'activity'. But there is a further twist to the story. Once the term *entelecheia* has been introduced by Aristotle, it nevertheless comes to be displaced again by *energeia*.

Aristotle uses *entelecheia* far less frequently than *energeia* (671 occurrences of *energeia*, 138 of *entelecheia*). This is not just because *energeia* is the earlier coinage. *Entelecheia* is common in only six places in Aristotle's corpus: *Phys.* 3 and 8, *GC* 1, *An.* 2, *Met. Δ* and *Z*. Further, in four of the places where *entelecheia* is common, *energeia*

nevertheless occurs more frequently (*Phys.* 3, 32, as opposed to 23; *Phys.* 8, 17, as opposed to 7; *An.* 2, 30, as opposed to 29; *Met.* Δ, 12 as opposed to 6). *Entelecheia* preponderates only in *GC* 1 (18 occurrences as opposed to 4 of *energeia*) and *Met. Z* (10 occurrences, with *energeia* entirely absent). So the newer coinage never becomes dominant. (Blair 1992: 7–16 summarizes the distributions of the two terms.)

There is a further striking point. It is *energeia* which preponderates in *Metaphysics* H, Θ, and Λ. There are just six occurrences of *entelecheia* in *Metaphysics* Θ (as opposed to sixty-seven of *energeia*): of these, two occur in an introductory section (Θ1, $1045^{b}33$–4, 35) and two specify the sense in which *energeia* is being used (Θ3, $1047^{a}30$; Θ8, $1050^{a}23$). The obvious conclusion to draw is that, in Θ's general discussion of potentiality and its contrasts, Aristotle has dropped the newer coinage *entelecheia* and returned to a neologism *energeia*, which, when first introduced, meant 'activity' rather than anything more general. So it seems appropriate in *Metaphysics* Θ to translate *energeia* as 'actuality', since 'activity' would misleadingly fail to register the widening application of *energeia* and its displacement of *entelecheia*. And, finally, since the displaced *entelecheia* occurs only rarely in Θ, it will not be too unsatisfactory to use 'fulfilment' as a merely conventional translation.

None of these decisions on translation answers the substantial question of *why* Aristotle, having coined *entelecheia* in order to express a notion wider than *energeia*, should then return in his main discussions to the earlier term *energeia*, and expend considerable effort in explaining why it is particularly appropriate to extend the application of *energeia* in this way. Since the original meaning of *energeia* is 'activity', why should it come to seem sensible to Aristotle to express the idea that something exists actually (*entelecheiai*) by saying that it exists 'in activity' (*energeiai*)? These questions are to be answered by working through Aristotle's text, rather than deciding points of translation.

5. CAPACITIES AND NATURES

The first part of *Metaphysics* Θ concentrates on capacities connected with change. Capacities are said to be *origins* of a certain kind (Θ1, $1046^{a}9$–10). Aristotle occasionally points out that a capacity

is just one sort of origin of change. Whereas the primary type of capacity is defined as an origin of change in other things (*Θ*1, 1046^{a}10–11), there are also *natures*: origins in something of changes in that thing itself (*Θ*8, 1049^{b}4–10, and *Phys.* 2.1–2, for a more general treatment; for discussion, see Charlton 1992 on the *Physics* chapters; Waterlow 1982*a*: chs 1–2; Kelsey 2003).

Origins of change include objects (*Met.* *Δ*1, 1013^{a}9, parents), features of objects (*Met.* *Δ*1, 1013^{a}9–10, insulting language; 20–1 thought and choice) and abilities (*Met.* *Δ*1, 1013^{a}13, *Θ*2 1046^{b}3–4, craft skills). All causes are origins (*Met.* *Δ*1, 1013^{a}16–17), and Aristotle admits a variety of items as causes (*Phys.* 2.3, 7).

When we say that A contains an origin of change, we refer to what it is about A which explains why it is that certain changes take place in situations which involve A. Merle's abusive language is an origin in that it explains why the party, which had been going well until he arrived, turned into a fight. An origin of change need not be what triggers a change. An ability, for example, is not an occurrence which triggers anything. Rather an origin is what it is about an object (for example, Candy; her medical knowledge) which explains why certain changes (administering treatment which lowers the patient's temperature) occur in changing situations involving that object (sudden sweating in the patient in Candy's surgery).

When we cite something about A in explaining why certain changes occurred in a situation in which A is involved, there are two cases to distinguish, depending on whether the changes which occur happen *to something else* or *to A*. I appeal to the heat of the *fire* in explaining why the *water* heated up when placed on the stove. In contrast I appeal to the physiology of *Candy* in explaining why *Candy* was nourished when she ate. In the first case we have a capacity, in the second a nature.

Matters are more complex, however. Aristotle does not say simply that a capacity is an origin of change in something else. He says that it is an origin of change in something else *or in itself qua something else* (*Θ*1, 1046^{a}10–11, *Θ*8, 1049^{b}6–7), while something's nature is an origin of change *in itself qua itself* (*Θ*8, 1049^{b}9–10; *Phys.* 2.1, 192^{b}21–7: a nature is an origin of changes in what possesses it non-accidentally).

In order to see the significance of these qualifications, consider examples in which we appeal to features of A to explain changes in A. Two types of case can be distinguished, according to *how*

those features of A are explanatory. In one the features of A explain changes in A in the very same way that they would also explain similar changes in things other than A. Suppose Candy heals herself (*Phys.* 2.1, 192^{b}23–4). Candy's medical skill explains *Candy's* receiving this treatment when she has a fever in just the same way as it would explain *Merle's* receiving the same treatment when he is febrile. The changes (treatment) which Candy's medical skill explains when she treats herself just *happen* to be changes in Candy; the way in which her medical skill explains the treatment does not appeal to the fact that it occurred in Candy. In this case Candy's medical skill is an origin of change in Candy but considered as something else, and an origin of change like that is a capacity.

Then the second type of case: suppose that food goes into Candy's mouth, Candy grows as a result, and we explain that by reference to Candy's physiology. In this case it is not true that Candy's physiology explains *Candy's* growth when she eats in the same way as it would explain *Merle's* growth when he eats. Whereas *Candy's* medical skill can explain both Candy's recovery and Merle's recovery, *Candy's* physiology could not explain *Merle's* growth at all. It is non-accidental that the growth explained by Candy's physiology is Candy's growth. Here we have an origin of changes in something considered as itself, and that origin of change is a nature.

The core point, then, is that what fixes whether an origin of change is a nature or a capacity is the location of the changes which it explains, and the way in which it explains those changes. An origin of change which is a nature explains changes which take place in the item wherein the origin is located, and explains them in ways in which it could not explain similar changes in other things. The issues involved in considering whether or not a particular change is natural are difficult. The conditions in which something finds itself may or may not be conducive to its manifesting its nature. A pine tree on fertile ground, and in an optimal environment, will grow straight and tall: such growth is natural for pines, and contributes to their biological flourishing. But pine trees are sometimes in unfavourable conditions, for example, hemmed in by other plants or rocks. In such interfering conditions the tree's nature will give rise to non-standard changes: twisted and gnarled growth. In contrast to the unimpeded straight growth, this is non-natural. But it is at the same time growth which results from, and is explained by, the pine's nature: it is natural-in-the-circumstances (see Commentary, Chapter 2,

§4, for more on the important notions of normal, interfering and blocking conditions).

This approach to the nature/capacity distinction has two advantages:

(i) the issue of whether a change in A is due to A's nature is decoupled from the issue of whether in changing naturally A *changes itself*. It might seem that the concepts of natural change and self-change should coincide, since it is tempting to think that, if a change in A is natural, then it originates from A, and so is something that A does to itself. But it would be better to explain natural change in a way that leaves this issue open. Aristotle's treatment of self-change is extremely complex (see *Phys.* 8.1–6; Gill and Lennox 1994 for a collection of papers on the topic). For example, in *Phys.* 8.4 Aristotle says explicitly that the elements move naturally, but do not move themselves (*Phys* 8.4, $254^{b}20$–2, with supporting arguments at $254^{b}35$–$255^{a}20$: it cannot be true that the elements move themselves because they are not alive). Further, it is unclear in precisely what sense animals move themselves, and how self-moving animals should be analysed into moving and moved aspects (*Phys.* 8.5, $257^{a}31$–$257^{b}13$; compare *Met.* *Θ*1, $1046^{a}28$–9). A distinction between natures and capacities drawn in terms of the location of the changes they explain, and the way in which those changes are explained, is neutral on the logical structure of the changes involved. We can agree that Candy's physiology can explain only *Candy's* growth, and that this brick's weight can explain only *its* downward motion, and agree that the nourishing and the falling are due to nature, without saying anything about the logical structure of growing and falling.

(ii) Aristotle is aware that in many cases one thing affects another reciprocally (*GC* 1.7, $324^{a}24$–$324^{b}13$). The fire both heats and is cooled by the pan of cold water placed on it. So it will often be the case, when we appeal to a feature of A to explain why B changes in a certain way in a given situation, that there are also, and non-accidentally, changes occurring in A in that situation. When the pan of water is placed on the hot fire, there is both a rise in temperature *in the water* and a concomitant drop in temperature *in the fire*. The heat of the fire is a capacity in that the change of temperature it explains occurs in something else (the water warmed up *because* the fire was hot); and, while in this situation there is inevitably also a

change of temperature in the fire itself, that cooling is not explained by the heat of the fire (the fire cooled down *because* the water was cold, and not because the fire was hot).

How significant is the distinction between natures and capacities for *Metaphysics* Θ as a whole? Both natures and capacities exemplify the potential–actual structure which Aristotle is interested in. In each case there is, on the one hand, an instance of potential being, and, on the other, the corresponding actual changes. As Candy is resting, she is *able* to digest food and walk around; and as she awaits patients in her surgery, she is *capable* of healing them. By contrast there are the actual digesting of food, the actual moving, and the actual treatment of patients. In so far as Aristotle's discussion of active and passive capacities in Θ1–5 is a consideration of a clear exemplar of the potentiality–actuality relation, he could just as appropriately have considered natures and the changes they give rise to. In fact, though, Aristotle says very little in Θ about natures as origins of change. Natural abilities sometimes occur as examples (typically perception: e.g. Θ3, $1047^{a}7$–10, Θ5, $1047^{b}31$–2, Θ6, $1048^{b}1$–2, Θ8, $1050^{a}10$–11). But it is rare for Aristotle's argument to turn on a point about natures (Θ1, $1046^{a}28$–9, a corollary drawn concerning self-change; Θ7, $1049^{a}13$–18, the account of what it is for something to be potentially is applied to the case of natures; Θ8, $1049^{b}5$–10, and $1051^{a}2$–3, a conclusion about priority is generalized to both capacities and natures; Θ8, $1050^{a}17$–19, a conclusion is applied explicitly to natures).

The decision to concentrate in *Metaphysics* Θ on capacities as opposed to natures is understandable for four reasons:

(i) Aristotle wants to make points about the difference and relation between active and passive capacities (e.g. Θ1, $1046^{a}11$–13, 19–28); and establish that necessarily, in the right circumstances, agent and patient give rise to changes (Θ5). Any reference to natures in contexts concerning agents and patients would generate only unhelpful complexity (for example, animals have senses as part of their nature; and the senses are in some way passive, a natural capacity to be affected by external perceptible objects (*An.* 3.2, $425^{b}26$–$426^{a}26$); but the precise way in which this should be understood is difficult and nuanced (*An.* 2.5 and Burnyeat 2002)).

(ii) Attention to natures is likely to bring rapidly to the surface a distinction found in the second half of Θ6 between complete and

incomplete changes ($1048^{b}18–35$). The development and behaviour of animals provide a clear case of what is natural, and these involve both incomplete and complete changes. For example, the natural heatings and coolings of blood by which bone, flesh, and the like are formed in the developing embryo are incomplete until a particular product results (*GA* 2.6, $743^{a}2–21$, $743^{a}36–743^{b}18$, $744^{b}11–745^{a}18$); a snake's burrowing underground in winter is an exercise of its nature, but is aimed at its reaching safe refuge (*HA* 8.15, $599^{a}33–599^{b}2$); and the overall natural development of an infant is directed towards the mature adult (*Met.* *Θ*8, $1050^{a}5–7$). But in many important cases the exercise of a nature gives rise to a complete change: seeing, contemplating, and living. The complete/incomplete distinction is not important for the first part of *Θ* (Chapters 1–5); and, as noted earlier (§1 above), its significance for Chapters 6–9 is disputed. It is easier for Aristotle to allow the distinction to lie in the background so long as the case of nature as an origin is not the focus of attention.

(iii) Aristotle's interest in *Metaphysics Θ* is the distinction and the correlation between the potential and the actual. The fact that potentiality is correlated with actuality is more immediately obvious in the case of capacities and changes than in the case of natures. If I say that something is capable, then grammar requires me to say what it is *capable of*, and if I refer to a capacity, I am required to refer to it as a *capacity for* such and such (compare *Θ*8, $1049^{b}12–17$, and Commentary, Chapter 8, §3: this point underpins Aristotle's argument that actuality is prior to potentiality in account). There is not the same grammatical pressure as regards talk of natures. I can say that horses are natural organisms, and refer to their equine nature without specifying the complete and incomplete changes which stand to that nature as the actual to the potential.

(iv) As already noted, Aristotle suffers acutely in *Metaphysics Θ* from a paucity of technical vocabulary, and the text is often hard to follow as a result. The noun *dunamis* is already overworked, referring both to a capacity and to a potentiality (§3 above). The term would only be further stretched if it were also to be applied to a general class of origins of change, of which capacities and natures were specific types. The generic use of *dunamis* to refer to both capacities and natures is rare, although there is no other obvious term for the job. There are separate chapters in *Metaphysics Δ* on natures and capacities (and they are not even adjacent: *Δ*4 on nature, *Δ*12

on *dunamis*). The term *dunamis* occurs just twice in the *Met.* $\Delta 4$ discussion of nature, and in neither case does it indicate a class of which natures and capacities are types (*Met.* $\Delta 4$, $1014^{b}28$, *dunamis*; $1015^{a}18$–19, *dumanei*); there is no mention at all of nature (*phusis*) in *Met.* $\Delta 12$. The lack of a clear terminology to refer generically to capacities and natures, and present them as on one side of the overarching dichotomy between the potential and the actual, makes it unsurprising that Aristotle does not say much about natures as an origin of change in *Metaphysics* Θ.

6. PERISHABLE SUBSTANCES

We can get some idea of the internal structure of *Metaphysics* Θ without deciding how the book relates to any grander Aristotelian projects. But it is helpful to approach Θ with some Aristotelian problems in mind. Such problems motivate us to work through the difficult internal structure of Θ. They give a sense of purpose to Θ. And, if the problems are of independent philosophical appeal, they will engage those who are not already drawn to Aristotelian exegesis. I will outline two broad problems to which Θ contributes. One connects Θ with the immediately preceding *Metaphysics Z* and *H* (§6: see also Gill 1989: Introduction); the other concerns the issues raised in *Metaphysics* Λ (§7). But the reader should be cautious here: as noted (§2), there is little agreement on the structure or project of Aristotle's *Metaphysics*.

Metaphysics Z and *H* are themselves extremely opaque books. But, on any view, they concern the notion of substance. Aristotle has argued in *Metaphysics Z* that the question 'what is being?' really comes to the question 'what is substance?' ($Z1$, $1028^{b}2$–4). A comprehensive answer to that question would involve saying both which items are substances ($Z2$, $1028^{b}28$–9) and what it is to be a substance ($Z2$, $1028^{b}31$–2).

Substances are the basic items in the world. They are basic in that they are ontologically independent: other things depend on them, while they do not depend on other things. And they are basic in that what goes on in the world is to be explained by reference to substances: substances are items which have natures (*Phys* 2.1, $192^{b}32$–4; *Met.* $Z17$, $1041^{b}27$–31).

For Aristotle, animals and plants have a strong claim to be substances. Substances like these have limited life spans. They come into existence, and are resilient to some changes but vulnerable to others: a dog is born, changes colour and size, but is killed by extreme changes of temperature. And the ways in which animals and plants come into existence and perish are not inexplicable mysteries, but can be explained in natural ways.

There is a problem as to how perishable things like these could possibly be substances. It is very appealing to suppose that something which comes into and goes out of existence in naturally explainable ways must have material components. The argument would be this. A substance is brought *into* existence because there are material precursors which can be worked on: one dog brings another dog into existence by fertilizing some matter. And material components secure the distinction between natural generation and destruction, on the one hand, and miraculous transformations and changes of place, on the other. When my dog dies there are material remains. It has not turned into the corpse (that would not be death, but an astounding transformation); nor has it just vanished elsewhere while a corpse has appeared in front of me (that would not be death but an inexplicable and discontinuous change of location).

But now a problem threatens. If there are material remnants, then they survived the changes which proved fatal to the putative substance. The temperature fell and Candy died; but the matter which is her corpse survived. In that case, however, the putative substance threatens to be just a stage in the history of those material components. Suppose the bricks persist through the explosion which destroyed the house. Then the house seems to be a stage in the history of those bricks, marked out by their gaining and losing a certain property or structure. But being a stage in the history of something else is inconsistent with being a substance. We do not think of six-foot-Candy as a substance precisely because 'she' is a stage in the history of Candy, marked off by the gain and loss of a certain height.

At this point there is an obvious response. A substance must have an identity independent of its material components if it is not to be just a stage in the history of those components. The human being Candy has material components. But the identity conditions associated with the substantial kind *human being* are independent

of those of the material components. It is one thing to persist as a human being, another to persist as a parcel of matter. Candy can survive as a human being independently of the matter which composes her: she undergoes material change, metabolizes, eats and respires. And the matter can survive independently of Candy: the corpse is there when she is gone. That is why Candy is not just a stage in the history of her material components, while six-foot-Candy is just a stage in the history of Candy. The identity conditions of six-foot-Candy are not independent of the identity conditions of Candy. If Candy ceases to exist, then six-foot-Candy ceases to exist; and, if six-foot-Candy persists, then Candy persists. So there are principled reasons to say that Candy is not just a stage in the history of her material components, while six-foot-Candy is just a stage in the history of Candy. And so a mortal living thing can be a substance, even though it has material components, so long as its identity as a substance (for example, a human being) is independent of its identity as matter (for example, as flesh and blood). In Aristotelian terms: a generable and destructible substance (for example, the individual human being Candy) is a complex of form (the human form) and matter (flesh and blood).

But that response generates a more difficult problem. The concern now is that the putative substance which is a complex of form and matter will lack a unitary nature. To say that something has a nature is to point to something about it which explains its characteristic ways of behaving and patterns of change (§5; *Phys* 2.1, especially $192^{b}20–3$). The current suggestion is that the identity conditions associated with the form have to be different from the identity conditions associated with the matter which at any particular time is characterized by that form. And the typical ways of changing and developing which are characteristic of being-human must align with the identity conditions associated with the substantial property being-human, and likewise *mutatis mutandis* for the stuff which is the material components of a human being. So, if the identity conditions associated with form and matter are different, then what it is to persist and change as a human being is different from what it is to persist and change as a lump of matter. In that case a form–matter complex has two natures—formal and material—rather than a single unitary nature; and that is inconsistent with a form–matter complex being a substance, since a substance is something which does have a unified nature.

It may seem now that there cannot be perishable substances. For there appears to be no satisfactory story to tell about how their form and matter are related. On the one hand, it is dangerous to identify them too closely. If the identity of the form depends on that of the matter, then the putative 'substance' threatens to be a stage in the history of the matter (as six-foot-Candy and Candy); if the identity of the matter depends on that of the form, then it is not clear how there can be genuine material remains, and it is hard to make sense of the substance being perishable. On the other hand, though, they cannot be too strongly distinguished, for in that case the putative substance tends to fracture into a pair of independent items.

One reaction would be to evade the problem by accepting that substances must be *im*perishable: either immaterial items such as Platonic Forms, numbers or sets; or indestructible material items such as atoms, basic stuffs, or elements. (The second route is likely to sound more appealing to modern ears.)

Another reaction though would be to find some way through the argument by looking for an account of the form–matter relation which would allow for the possibility of perishable substances. Aristotle tries to do this by modelling the relation between form and matter on another relation, between actuality and potentiality (*Met.* *H* 3, $1043^{a}30$–1; H6, $1045^{a}23$–5); and then arguing that the relation between actuality and potentiality elucidates the form–matter relation in just the way we want (*Met.* *H* 6, $1045^{b}16$–23; *Phys.* 4.5, $213^{a}6$–10; *An.* 2.1, $412^{b}4$–9). In order to see whether he has a chance of succeeding, we need to work through a good deal of *Metaphysics Θ* (see Commentary, Chapter 7, §7, and Chapter 8, §10).

7. ETERNAL SUBSTANCES

According to the sort of project pursued in *Metaphysics Λ*, there are three types of substance (*Λ* 1, $1069^{a}30$–$1069^{b}2$; *Λ* 6, $1071^{b}3$–4): perishable sensible substances, eternal sensible substances, and substances which are entirely unchangeable. Concerning some there is common agreement about examples (everyone recognizes animals and plants as perishable sensible substances), concerning others there is not (are there unchangeable substantial Platonic Forms or not?). *Λ* is aimed at establishing Aristotle's own conclusions about the non-sensible substantial realm: for example, that there

is something which itself is unchanging, which is somehow the source of all change, and which is eternal, substance and actuality (*Λ*7, 1072^{a}24–6). The first half of the book (*Λ*1–5) concerns the sensible realm, the second half the non-sensible (*Λ*6–10). It is not necessary to work out a very detailed view of *Λ* in order to recognize an important feature of the use of potentiality–actuality in that book: the idea of actuality which is independent of any correlative potentiality (*Λ*7, 1072^{b}4–8). The main distinction round which *Θ* turns does not prepare for this. *Θ*1–5 focus on capacities and the *correlative* changes which are their exercise. The wider perspective of *Θ*6–9 brings in more difficult cases, but still presents matter and substance as *correlates* (*Θ*6, 1048^{b}4–9). It is only towards the end of *Θ*8 that we come upon actuality without any correlated potentiality: 'nothing eternal is potentially' (*Θ*8, 1050^{b}7–8: the discussion occupies 1050^{b}6–1051^{a}2). There is a detailed treatment of that material in the appropriate section of the Commentary (Chapter 8, §§11–14). The question here is whether we should find the idea of detached actuality at all engaging.

One main reason to take capacities and potentialities seriously is that they are *explanatory*. The fact that the liquid is *corrosive* explains why I keep it away from my walnut table. The fact that Candy is *capable* of healing explains why she is a good person to take on the Arctic expedition, even though she is not presently curing anyone. In *Θ*3 Aristotle criticizes those who deny the existence of unexercised capacities, on the grounds that these people lack this explanatory resource. It must seem surprising to them when someone who is not capable of building nevertheless starts to erect houses (*Θ*3, 1046^{b}33–1047^{a}4).

Further, an important way in which capacities and potentialities explain is by connecting items which would otherwise be puzzlingly independent. Candy drank that liquid yesterday and died: why should I avoid it today? Because the fact that it actually poisoned her yesterday is evidence that it is poison*ous*, and the fact that it has the capacity to poison suggests that it will poison me if I drink it today. Episodes which are otherwise independent are connected together as manifestations of a capacity which persists unexercised, and the occurrence of those episodes is thereby rendered non-coincidental. The same holds as regards potentialities more generally. Viewing the bricks from which an actual house is built, and into which it is demolished, as potentially a house connects various stages together into an

integrated process of (artificial) generation, existence, and destruction. The material precursors of the house explain its coming into existence, the material remnants make it clear that it was destroyed.

So one reason to take capacities and potentialities seriously is that they provide explanatory continuity between items which would otherwise be inexplicably independent. To that extent there is no reason to introduce capacities and potentialities in cases which do not involve episodic discontinuity. The fire boiled the water on Monday, burned the wood on Tuesday, and baked the bread on Wednesday. Reference to its heat explains the boiling, burning, and baking by connecting them together as exercises of a persisting capacity to produce a particular type of change in certain situations. In the absence of that capacity, it should be puzzling why something which boiled water on Monday should bake bread on Wednesday. But now consider something acting in a particular way without interruption: following Aristotle, the stars moving in the heavens (agreed examples will be harder to come by). Since the motion is uninterrupted, there are no discrete episodes of motion to be connected together, and so thus far there is no reason to suppose that this motion is the exercise of a capacity to move.

This line of thinking prepares us for Aristotle's discussion of detached actuality in the later part of *Θ*8, and it accommodates two further points about Aristotle's position.

First, something which persists in the same fashion in one respect can exhibit variation in other respects. The star which moves without interruption is not uninterruptedly in a particular place. Quite the contrary. It is first in one place, then in another, then in another. And so, while there may be no reason to associate its motion with a capacity to move, there is reason to attribute a potentiality to be in one place or another (*Θ*8, $1050^{b}20–2$).

Second, concentration on the explanatory role of capacities and potentialities reinforces the decision to mark a difference in translation between capacities and possibilities (§3). The idea of A's ϕ-ing (eternally) without exercising or possessing a capacity to ϕ would be very difficult if capacities were standard modalities. For a standard weak modality is precisely one which obeys the principle

[T] A ϕ's → A can ϕ.

But it is the fact that capacities are non-standard which enables them to be explanatory: A's capacity to ϕ can explain A's ϕ-ing

precisely because A's ϕ-ing does not entail that A has a capacity to ϕ. Possibility, in contrast, is a standard modality. And reference to possibility is not explanatory. I cannot explain A's ϕ-ing by saying that it is possible that A ϕ's just because A's ϕ-ing entails that it is possible that A ϕ's. If we consider only *possibility*, then, there will be no room for the idea of detached actuality: if A ϕ's eternally, then it is possible that A ϕ's eternally. But what that shows is that Aristotle's discussion in *Θ*8 treats of a notion of capacity and potentiality much richer than bare possibility, and that should come as no surprise to anyone by Chapter 8 of *Metaphysics Θ*.

TRANSLATION

CHAPTER 1

That which is primarily, and to which all the other categories of being are referred, has been discussed—namely substance (for the others are called beings in accordance with the account of substance, i.e. quantity, quality and the others which are so called: for they will all involve the account of substance, as we said in the earlier discussions). **1045b**

Since, however, being is said on the one hand to be what* or like-what or how-much, and on the other in accordance with potentiality and fulfilment and in accordance with the function, let us make determinations about potentiality and fulfilment as well—and first about potentiality most properly so called, though it is not the most useful for what we want now. For potentiality and actuality extend more widely than those cases which are so called only in respect of change. But when we have spoken about this, we shall in the distinctions about actuality clarify the others as well. **1046a**

We have shown elsewhere that potentiality and being potential are spoken of in many ways. Of these, those that are called potentialities homonymously should be set aside (for some are so called because of some similarity, as in geometry and as we speak of what is possible and impossible because things are or are not in a certain way); whereas with those that relate to the same type, they are all origins of some kind, and are so called in relation to one which is primary, which is an origin of change in something else or in itself *qua* something else. For one is the capacity to be acted on, the origin in what is itself affected of being changed and acted on by something else or by itself *qua* something else; another is the state of not being liable to be acted on for the worse and so as to be destroyed by something else or by itself *qua* something else—i.e. by an origin of change. For there is in all these definitions the account of the primary capacity. Again these capacities are so called either as solely

Square brackets indicate supplements provided in translation in order to make the highly compressed Greek intelligible and which are controversial or striking. Asterisks indicate a textual note (see pp. 271–3).

acting or being acted upon, or as acting or being acted upon well, so that also in their accounts the accounts of the previous capacities somehow occur.

It is plain then that there is in a way one capacity of acting and being affected (for something is capable both in that it has a capacity of being acted upon and in that something else can be acted on by it), but in another way they are different. For the one is in the thing affected (for it is because it has a certain origin, and because the matter also is a certain origin, that what is affected is affected, and one thing by another; for what is oily can be burnt while what yields in a certain way can be crushed, and similarly as regards other cases); the other in contrast is in what acts, such as heat and the building craft—the one in what can heat and the other in what can build. That is why, *qua* naturally unified, nothing is affected by itself; for it is one, and not something else.

And incapacity and being incapable are the privation that is opposite to the capacity of this sort, so that every capacity and incapacity are for the same thing and in the same respect. Privation is spoken of in many ways; for it covers both what does not have a feature, and a feature which is natural but which something does not have, either generally or when it is natural, and either in a certain way, for example, entirely, or even in any other way. As regards some cases which naturally have a feature, but do not have it due to force, we say these have been deprived.

CHAPTER 2

Since some origins like this are present in what is soul-less, while others are in what has a soul, and are in the soul, and are in that part of the soul which is rational, it is clear that of capacities too some will be non-rational, while others will be rational. That is why all crafts and all productive sciences are capacities. For they are origins of change in something else, or in the thing itself *qua* something else.

As regards those capacities which are rational, the very same capacity is a capacity for opposites, but as regards the non-rational capacities a single capacity is for one thing: for example, heat only for heating, while the medical craft for both disease and health.

The explanation of this is that knowledge is an account, and the same account clarifies both the thing and the privation, though not

in the same way, and in one way it concerns both, while in another way it concerns rather the positive. So it is also necessary that such sciences should be of opposites, but concerning the one *per se* while concerning the other not *per se*. For indeed the account concerns one opposite *per se*, but concerns the other opposite in a way incidentally: for it is through denial and negation that it clarifies the opposite—for the primary privation is the opposite, and this is the negation of the other.

Now since opposites do not occur in the same thing, and knowledge is a capacity in that it involves the possession of an account, and the soul has an origin of change, it follows that while what is wholesome produces only health, and what can heat produces only heat and what can cool produces only cold, someone who has knowledge produces both. For the account concerns both, though not similarly, and it is in the soul which has an origin of change; so it will change them both from the same origin, having connected them to the same thing; that is why what is capable in accordance with an account produces opposites by means of what is capable without an account; for they are covered by a single origin, the account.

It is evident as well that while the bare capacity for doing something or being affected in some way follows the capacity for doing that thing well, that latter capacity does not always follow the former capacity. For it is necessary that someone who does something well also does it, but if someone is just doing something it is not necessary that he also does it well.

CHAPTER 3

There are some—such as the Megarians—who say that something is capable only when it is acting, and when it is not acting it is not capable. For example, someone who is not building is not capable of building, but someone who is building is capable when he is building; and likewise too in other cases.

It is not hard to see the absurd consequences of this. For it is clear that someone will not be a builder either unless he is building (for to be a builder is to be capable of building), and likewise in the case of the other crafts. If therefore it is impossible to possess such crafts without having at some time learned and grasped them, and subsequently not to possess them without having lost them at some

1047[a] time (either by forgetting or by some misfortune or through time; not of course through the destruction of the thing, for that always is), whenever someone stops, he will not possess the craft, and how will he have grasped it when he immediately starts building again?

It is the same too as regards inanimate things. For there will be no cold or hot or sweet or in general anything perceptible if things are not being perceived; so it will turn out that they assert the view of Protagoras.

Indeed nothing will possess perception if it is not perceiving and acting. So if something is blind which does not possess sight, though it is natural that it should and when it is natural and moreover in the manner* in which it is natural, the same people will be blind many times in the day, and deaf too.

Again, if what is deprived of a capacity is impossible, it will be impossible for what is not happening to happen; but someone who says, of something that is impossible to happen, that it either is or will be, says something false (for the impossible meant that), so that these views do away with change and coming to be. For what is standing will always stand, and what is seated will always be seated; for being seated it will not get up; for it is impossible for something not capable of getting up to get up. So if these things cannot be said it is plain that capacity and actuality are different (for those arguments make capacity and actuality the same, and so it is no small thing that they try to abolish), so that it can be possible to be something and yet not be that and possible not to be something and yet be that, and likewise too in the case of the other categories—it is possible for something not walking to walk, and possible for something walking not to walk.

And this is what is possible—that for which, if the actuality of which it is said to have the capacity obtains, there will be nothing impossible. I mean, for example, if it is possible for it to sit and it can sit, should sitting belong to it, there will be nothing impossible. And likewise in the case of being changed or changing or standing or making stand or being or coming to be or not being or not coming to be.

The term 'actuality', the term connected with fulfilment, has also been extended to other cases from applying most of all to change. For it seems that actuality most of all has its being *qua* change* which is why in addition people do not assign change to non-beings, though some other predicates, such as being thought about and being desired, are predicated of non-beings, but not being changed,

and this is because while not being actually they will be actually. For some of the things which are not are potentially; but they are not because they are not in fulfilment. **1047b**

CHAPTER 4

If what has been said is the possible or follows from it,* it is evident that it cannot be true to say that this is possible but nevertheless it will not be, the consequence being that in this way what is impossible to be gets away. I mean, for example, if someone were to assert that it is possible for the diagonal to be measured, although it will not be measured—someone who does not take into account what is impossible—because nothing prevents it being possible for something to be or come to be which neither is nor will be. But from what is laid down this is necessary, that if we were to assume that something which is not, but is possible, is or has come to be, there will be nothing impossible; but it *will* turn out that there is something impossible, for the diagonal's being measured is impossible. For the false and the impossible are certainly not the same; for that you are standing now is false, but not impossible.

At the same time it is clear also that, if when A is the case it is necessary that B is the case, then also if A is possible it is necessary that B is possible; for if it is not necessary that it is possible, nothing prevents it not being possible. Then let A be possible.* Therefore, whenever A would be possible, if A were assumed, nothing impossible would have turned out; but then it is necessary that B is the case. But that was impossible. Then let it be impossible. Then if B is impossible,* it is necessary that A is too. But then the first was impossible; so the second also. So if A were possible B will be also, if indeed they were so related that if A is the case it is necessary that B is the case. Then if, when A and B are related in this way, it were not the case that B is possible in this way, A and B will also not be related as laid down. And if when A is possible it is necessary for B to be possible, then if A is the case it is necessary also for B to be the case. For that B is of necessity possible, if A is possible, means this, that if A ever were the case both when and as it was possible then necessarily that too is at that time and in that way.

CHAPTER 5

As all capacities are either innate, like the senses, or come about by habit, like that of flute playing, or by learning, like that of the crafts, in the case of some, previous practice is necessary for their possession, namely those of them which come about by habit and by reason, but it is not necessary for those which are not of this sort, and for those which involve being affected.

Since what is capable is capable of something and at some time and in some way and with however many other factors it is necessary to add to the specification, and some things can produce changes in accordance with reason and their capacities are rational ones, while other things are non-rational and their capacities are non-rational ones, and the former must be in what has a soul while the latter are in both, with the latter it is necessary, whenever agent and patient approach each other so as to be capable, that the one act and the other be affected; but with the former this is not necessary. For all these latter are productive of one thing, and those former are productive of opposites, so that they would produce opposites at the same time; but this is impossible.

Then there must be something else which is decisive: I mean by this desire or choice. For whichever it desires decisively, in this way it will act when it is in the condition to be capable, and approaches the patient. And so it is necessary that everything which is capable in accordance with reason, whenever it desires that for which it has the capacity, and in the manner wherein it has the capacity, should act in this way.

And it has [the capacity] when the patient is present and has [its capacity] in this way;* and if not, it will not be capable of acting.

(For it is not necessary to specify in addition that nothing external prevent it; for it has the capacity in so far as it is a capacity for acting, and that is not in any and every condition, but just in some circumstances, in which external things preventing will be ruled out as well; for these are set aside by some of the things present in the specification of the capacity.)

That is why even if someone at the same time wished or wanted to do two things or opposites, he will not do them. For it is not in this way that he has the capacity for them, nor is it a capacity to do them at the same time, since it will do things for which it is the capacity in the way in which it is the capacity.

CHAPTER 6

Since we have spoken about potentiality so called in respect of change, let us draw distinctions about actuality—what actuality is and what kind of thing it is. For in fact the potential will become clear as we analyse, because not only do we call potential that which by nature is such as to change something else or be changed by something else, either without qualification or in a certain way, but the potential is also spoken of differently, which is why in enquiring we also considered these.

Now actuality is the existence of the thing not in the way we call potentially; and we call potentially, for example, Hermes in the wood and the half line in the whole, because they could be separated, and also someone not contemplating we call a knower, if he is capable of contemplating; and in contrast we call other things actually.

What we want to say is clear from the particular cases by induction, and one should not look for a definition of everything but should also take in what is analogical,* because as what builds is to what can build, and what is awake to what is asleep, and what is seeing to what has closed eyes but has sight, [so is] what has been separated off from the matter to the matter, and what has been finished off to what is unwrought. Of these contrasts let the actuality be defined by the one part, the potential by the other.* Actually is not in all cases said in the same way, but is said by analogy, as this in this or to this, so that in that or to that; for while the one is as change to potentiality the other is as substance to some sort of matter.

And the infinite and the void, and other such like things, are said to be potentially and actually in another way from many other things,* for example what sees and what walks and what is seen. For these things can sometimes be truly said without qualification as well (for what is seen is on the one hand so called because it is seen, and on the other because it is capable of being seen); but the infinite is not potentially in this way, namely that it will be actually separate, but by coming into being.* For it is the division's not coming to an end which makes it the case that this actuality is potentially, and not the infinite being separated.

Since of actions of which there is a limit none is a completion, but is rather related to a completion—for example, making thin,* these [bodily parts] themselves when being made thin are in change in this way, and those things which the change is for the sake of

do not yet obtain—these things are not an action or at least are not complete (for there is no completion); but that in which the completion inheres is also action.* For example, at the same time one is seeing [[and has seen]], and is understanding [[and has understood]] and is thinking and has thought, but it is not that one is learning and has learned, nor is one being healed and has been healed. And one is living well and has lived well at the same time, and one is flourishing and has flourished. If not, it would have had to stop sometime as in the case of making thin, but as it is this is not so, but one is living and has lived. Of these then [[it is necessary]] to call some changes, and others actualities. For all change is incomplete, thinning, learning, walking, house building; these are changes and surely incomplete. For it is not at the same time that one is walking and has walked, nor building a house and having built a house, nor coming to be and having come to be, nor being changed and having been changed, but these are different, and so too if something is bringing about change and has brought about change.* But the same thing at the same time has seen and is seeing, and is thinking and has thought. So I call such a thing an actuality, but that thing a change.*

So let what the actual is and what kind of thing it is be clear to us from these and similar points.

CHAPTER 7

One must determine when each thing is potentially and when not; for it is not just at any time. For example, is earth potentially a man? Or not, but rather when it has already become seed, and perhaps not even then? It is, then, just as it is with health: not everything can be healed by the medical craft or by chance, but there is something which is capable of being healed, and this is potentially healthy.

A definition of what comes to be in fulfilment by thought from what is potentially, is that when it is wished it comes about, if nothing external prevents it, and on the side of what is healed, when nothing in it prevents it. Similarly also with what is potentially a house; if nothing in this and in the matter prevents the coming to be of a house, nor is there anything which needs to be added or taken away or changed, this is potentially a house; and in this way too as regards

as many other things of which the origin of coming to be is external. And then for as many things as have [the origin] in themselves, [they are potentially] through themselves, whenever nothing external is interfering; for example, the seed is not yet [potentially a man] (for it needs to fall* in something else and change), but when through its own origin it is already such a character, it is then potentially this; but the former needs a different origin, just as earth is not yet potentially a statue (for it must have been changed to become bronze).

It seems that what we call not this, but thaten—for example, we call the box not wood but wooden, and the wood not earth but earthen, and again in the case of the earth if it is in this way, not something else, but thaten—that is always without qualification potentially the next thing. For example, the box is not earthen nor earth but wooden; for this is potentially a box and this is matter for a box, wood without qualification for box without qualification and this wood for this box. But if there is something primary which is no longer called thaten in respect of something else, this is primary matter; for example if earth is airy, and air is not fire but firey, fire is primary matter not being a particular this. For that in respect of which and that which underlies differ in this way, by being or not being a particular this; for example that which underlies the affections is man, both body and soul, and the affection is musical and pale (for that thing is said to be, when music comes to be [in it], not music but musical, and the man is not pallor but pale, and not a walk or a change, but walking or changing, like the thaten)—so in all such cases as these, the final [underlying subject] is substance. But in all cases which are not like this but what is predicated is some form and a particular this, the final [underlying subject] is matter and material substance. And so it rightly turns out that thaten is said in respect of the matter and the affections; for both are indefinite. **1049ᵇ**

So it has been stated when potentially is said, and when not.

CHAPTER 8

Since it has been determined in how many ways prior is said, it is evident that actuality is prior to potentiality. And I mean by potentiality not only that defined kind which is called an origin of change in something else or in a thing *qua* something else, but

generally all origins of change or remaining static. For nature too is in the same class as potentiality; for it is an origin of change, though not in something else but in a thing itself *qua* itself. Then actuality is prior to all potentiality of this sort both in account and in substance; and in time in one way it is and in another way it is not.

At all events it is clear that it is prior in account (for it is because it can be active that what is capable primarily is capable, for example, I mean by able-to-build what is capable of building and by able-to-see what is capable of seeing and by visible what is capable of being seen; and there is the same account also in the other cases, so that it is necessary for the account and the knowledge of the one to precede the knowledge* of the other).

In time it is prior in this way; what is actual, which is the same in form, but not in number, is prior. I mean this, that prior in time to this man who is already in actuality and the wheat and the seeing, are the matter and the seed and the able-to-see, which are potentially man and wheat and one seeing, though not yet actually; but prior in time to these there are others which are actually, from which these came to be; for it is always the case that from what is potentially what is actually comes to be, by means of what is actually, for example, man from man, musician by means of musician, in each case something bringing about change first; and what brings about change already is actually. It was said in the discussions about substance that everything which comes to be comes to be something from something and by means of something, and this is the same in form.

That is why also it seems impossible to be a builder if one has not built anything, or a harpist if one has not played the harp; for it is by playing the harp that someone learning to play the harp does learn to play the harp; and likewise too for other people. It is from this that the sophistical puzzle arises, that someone who does not have knowledge will be doing that which the knowledge is of. For the learner does not have knowledge. But because something of what is coming to be has come to be and in general something of what is changing has changed (this is clear in the discussions about change) the learner too must perhaps have something of the knowledge. But at all events it is also clear from this too that actuality is prior in this way to potentiality also, namely in respect of coming to be and time.

But indeed actuality is prior in substance too, first because things posterior in coming to be are prior in form and in substance (for example, adult to boy and man to seed; for the one already has the

form, the other does not), and because everything that comes to be proceeds to an origin and an end (for that for the sake of which is an origin, and the coming to be is for the sake of the end), and the actuality is an end, and the potentiality is acquired for the sake of this.

For it is not that animals see in order that they may have sight but they have sight so that they may see, and likewise too they possess the building craft in order that they may build and the contemplative ability in order that they may contemplate; but it is not that they contemplate in order that they may have the contemplative ability, except those who are practising; and they do not contemplate except in a certain way, or because they have no need to contemplate.*

Again the matter is potentially because it may go to the form; and at any rate whenever it is actually, then it is in the form. And likewise too in the other cases, and those where the end is a change, which is why just as teachers think they have provided the end when they have shown [their pupils] active, nature also [does] likewise. For if it does not come about in this way it will be like Pauson's Hermes; for it is unclear whether the knowledge also is internal or external, just as in that case too. For the functioning is the end, and the actuality the functioning; and that is why the name 'actuality' is employed with respect to the functioning and points towards the fulfilment.

And since in some cases it is the exercise that is final (for example, seeing in the case of sight,* and nothing different in addition to this comes to be from sight*), but from others there does come to be something (for example, from the building craft a house in addition to the act of building), it is nevertheless in the one case no less the end, in the other more the end than the potentiality. For the act of building is in what is being built and comes to be and is at the same time as the house. So in all the cases where what comes to be is something different in addition to the exercise, in these cases the actuality is in what is being made (for example, the act of building is in what is being built, and the act of weaving is in what is being woven, and likewise too in other cases, and generally the change is in what is being changed); while in all the other cases where there is no other product in addition to the actuality, the actuality is in them (for example, seeing in the one seeing and contemplation in the one contemplating and living in the soul, which is why flourishing is also; for it is a kind of living). So it is evident that the substance and the form are actuality. Indeed, in accordance with this argument it is evident that actuality is prior in substance to potentiality, and, as we

said, one actuality always precedes another in time until that which is primarily bringing about change in each case.

But indeed actuality is prior in a more proper way too. For eternal things are prior in substance to perishable things, and nothing eternal is potentially. Here is the reason. Every potentiality is at the same time for the contradictory; for while what is not capable of obtaining cannot obtain in anything, everything that is capable can fail to act. So what is capable of being can both be and not be; so the same thing is capable both of being and of not being. And what is capable of not being can fail to be; and what can fail to be is perishable, either without qualification or in that way in which it is said that it can fail to be, either in respect of place or in respect of quantity or quality; and without qualification is in respect of substance. So nothing that is imperishable without qualification is potentially without qualification (but nothing prevents its being so in a certain respect, for example, in respect of quality or location); so all [eternal things] are in actuality; and nor are any of the things which are of necessity [potentially] (and yet these are primary; for if these were not, nothing would be); nor then is change [potentially] if any change is eternal; nor if there is something eternally changed is it changed in accordance with potentiality except for from-where and to-where (for nothing prevents there being a matter for this).

That is why the sun and the stars and the entire heaven are always acting, and there is no fear that they may stop at some time, which those who investigate nature fear. Nor do they get tired in doing this; for the change for them does not concern a potentiality for the contradictory, as it does for perishable things, and so the continuity of the change is not laborious; for the cause of this is the substance which is matter and potentiality, not actuality.

The things which are imperishable are also imitated by things which are in change, for example, earth and fire. For these too are always acting; for they have change both *per se* and in themselves. But the other potentialities, from what has been determined concerning them, are all for the contradictory; for what is capable of bringing about change in a certain way is capable also of not bringing about change in this way, at any rate in all the cases which are in accordance with reason; and one and the same non-rational [capacity] will be for the contradictory by being and not being present.

So if there are some natures or substances such as people in the arguments say the Ideas are, there will be something much

more knowing than knowledge itself, and much more changing than change; for these are actualities to a higher degree, and those are potentialities for them. 1051a

Therefore that actuality is prior both to potentiality and to every origin of change is evident.

CHAPTER 9

That the actuality is also better and more valuable than the good potentiality is clear from the following. For in the case of those things which are said in accordance with being capable, the same thing is capable of opposites, for example, the same thing which is said to be capable of being healthy is also capable of being diseased, and at the same time. For the same capacity is for being healthy and for being ill, and for remaining at rest and for being changed, and for building and for demolishing, and for being built and for collapsing. So being capable of opposites obtains at the same time; but the opposites obtaining at the same time is impossible, and it is impossible for the actualities to obtain at the same time (for example, being healthy and being ill); so that it is necessary for the good to be one of these two, but being capable is in the same way both or neither; so the actuality is better. It is necessary also in the case of bad things for the end and the actuality to be worse than the potentiality; for the same thing is capable of both opposites.

So it is clear that the bad is not in addition to the things; for the bad is posterior in nature to the potentiality.

So neither in the things which are from the beginning nor in the eternal things is there anything either bad or defective or corrupted (for corruption is also one of the bad things).

And the constructions are discovered in actuality; for they discover them by dividing. If they had been divided they would have been evident; but as it is they are in there potentially. Why is the triangle two right angles? Because the angles around one point are equal to two right angles. So if the line parallel to the side had been drawn up, it would have been clear immediately on seeing it. Why is there universally a right angle in the semi-circle? Because if three lines are equal,* the two which are the base and the one dropped straight from the centre, it is clear on seeing it to the person who knows that.

So that it is evident that the things which are potentially are discovered when they are drawn out into actuality; the explanation is that thinking is the actuality;* so that the potentiality is from actuality, and because of this they know by making (for the individual actuality is posterior in coming to be).

CHAPTER 10

Since being and not being are said on the one hand in accordance with the figures of the categories and on the other in accordance with the potentiality or actuality of these or of their opposites, and third as what is in the most proper way* true or false, and since this as regards things is as the result of their being combined or divided, so that that person speaks the truth who thinks what is divided to be divided, and what is combined to be combined, and the person whose thinking is in the opposite way to the things speaks falsely—when is there or is there not what is termed truth or falsity?* For it has to be considered what we mean by this.

For it is not because of our truly thinking you to be pale that you are pale, but it is rather because you are pale that we who say this speak the truth. So, if some things are always combined and it is impossible for them to be divided, and others are always divided and it is impossible for them to be combined, and yet others can be either of the opposites, then on the one hand to be is to be combined and to be one, while on the other not to be is not to be combined but to be more;* and therefore in connection with those which can be either of the opposites the same belief and the same statement come to be both false and true, and someone can at one time speak the truth and at another time speak falsely. But in connection with those which are impossible otherwise beliefs and statements do not come to be at one time true and at another time false, but the same ones are always true and false.

Then in connection with the incomposites, what is it to be or not to be and what is truth and falsity? For it is not composite in this case, so that they would be when put together and not be when separated, as it is in the case of the wood being white* or the diagonal being incommensurable; nor will truth and falsity still obtain in the same way as in those cases. Rather just as truth is not the same as regards these, so too neither is to be [the same as regards incomposites];

instead there is truth or falsity in the following way, to make contact and to state is truth (for affirmation and stating are not the same), while to be ignorant is not to make contact.

For it is not possible to be mistaken in connection with the what-it-is, except accidentally; and similarly too in connection with the substances which are not composite, for it is not possible to be mistaken; and all these substances are actually, not potentially, for if they were potentially they would have come to be and perished, but as it is being-itself neither comes into being nor perishes, for if it did it would come into being from something. So then, for those things which are just what it is to be something and actualities,* in connection with these it is not possible to be mistaken but all that is possible is either to think them or not; but the what-it-is is investigated in connection with them, whether they are such like or not.

While as regards being as correlated with truth and that not being which is correlated with falsity,* there is one [case] where if it is combined [that is correlated with] truth, and if it is not combined [that is correlated with] falsity; on the other hand there is one [case] where if in fact it is, then it is thus and so; and if it is not thus and so, then it is not. Truth is to think these; and there is no falsity, nor **1052a** is there any mistake, but [only] ignorance—not [however the sort of ignorance which is] like blindness. For blindness is like the case in which someone does not possess the ability to think at all.

It is also evident that in connection with the unchangeable things there is no mistake in respect of time, if one supposes [that there are] unchangeable things. For example, if one thinks that the triangle does not change, one will not think that at one time it does have two right angles but at another it does not (for in that case it would change), but [it can be that] on the one hand some [are] while on the other hand some [are] not. For example, [someone thinks that] no even numbers are prime, or [that] some are and some are not. But in the case of a single thing one in number not even this [is possible]; for he will no longer think one is and another is not, but he will speak the truth or will speak falsely [in the same way] as [in the cases in which it is] always so.

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COMMENTARY

CHAPTER 1

1. An Overview of the Chapter

The chapter starts by marking the transition from the preceding books of the *Metaphysics* ($1045^b27–32$: the back references at 1045^b28 ('has been discussed') and 1045^b32 ('the earlier discussions') are to the immediately preceding books *Z* and *H*.

To the extent that Aristotle gives a clear statement of the structure of *Met.* *Θ*, he does so in $1045^b32–1046^a4$ (see also the opening of *Θ*6, $1048^a26–30$). For a summary of the structure of *Θ* as a whole, see Introduction, §1.

The discussion of capacities starts with the identification and exclusion of marginal cases ($1046^a6–9$). Aristotle then presents an analysis of the various types of capacity for change and identifies the active capacity of an agent to bring about a change as the central case ($1046^a9–11$), to which all other types of capacity are to be related ($1046^a11–19$ provides details).

An account of the various types of capacity is also to be found in *Met.* *Δ*12. The present discussion departs from that in some details, although at places the *Θ* discussion is more condensed, and can best be understood by reference to *Δ*12. Owen, at Burnyeat (1984: 46–8), compares *Met.* *Δ*12 and *Θ*1. Kirwan (1971) comments on *Δ*12. One notable divergence from *Δ*12 is that in *Θ*1 Aristotle interrupts the account of different types of capacity to argue for two claims about the relation between active capacities, such as fire's capacity to heat, and passive capacities, such as water's capacity to be heated ($1046^a19–29$):

[A] The active capacity to ϕ and the passive capacity to be ϕ-ed are in a way a single capacity ($1046^a19–20$).
[B] The active capacity to ϕ and the passive capacity to be ϕ-ed are in a way distinct capacities (1046^a22).

[A] is briefly supported at $1046^a21–2$, and [B] explicated in greater detail at $1046^a22–9$.

The chapter ends with a summary statement concerning different types of incapacity (1046[a]29–31), leading on to some remarks on privation (1046[a]31–5).

2. 1045[b]32–1046[a]4: The Structure of *Metaphysics Θ*

The structure of *Met. Θ* described at Introduction, §1, is largely due to Michael Frede (1994). However, it is not accepted by all.

An alternative is provided by Ross (1924). Ross distinguishes two notions: *power*—that is, the capacity of (one part of) one thing to produce a change in another (part); and *potentiality*—that is, a capacity in something of passing into a new state of itself (Ross 1924: pp. cxxiv–cxxv; Ross 1995: 182; summary at Frede 1994: 176–7). According to the Ross approach, the first and second parts of *Θ* consider these different topics, power and potentiality. While the discussion of powers (capacities for change) in Chapters 1–5 *prepares* for the discussion of potentiality and potential being in Chapters 6–9, it is not itself part of that discussion.

In contrast, according to the Frede approach endorsed in the Introduction (§1), the consideration of active and passive capacities in *Θ* 1–5 is already a consideration of actual and potential being. The later chapters extend the earlier discussion. They do not move to a radically separate topic. The Frede approach to *Θ*, in more detail, is as follows.

Consider the sort of case which features in the first part of *Θ*: the capacity possessed by a saw to cut wood. The exercise of that capacity gives rise to an actual change: an actual cutting of something by a saw. In addition, producing a change is a way of being real or being actual: a saw is actually being a saw, is most really a saw, in cutting. Similarly, possessing the unexercised capacity to cut is also a way of being real: not of course being actual, but being potential. What possesses the unexercised *capacity* to cut is by that very fact an example of a *potential* being. Its being *in potentiality* is not something extra over and above its capacity to cut. It just is its capacity to cut, considered in contrast to its way of being when the capacity is exercised. So consideration of such capacities as the capacity to cut will already be consideration of the way of being—*potential* being, or being *potentially*—that is the centre of Aristotle's metaphysical interests at this point.

However, those metaphysical interests lead beyond the initial discussion of capacities for change. So a wider perspective on the

relation of actual and potential being emerges only in Chapters 6–9. For, while producing a change is *a* way of being actual, it is not the *only* way of being actual. First, there are types of 'doing' which are very different from changes such as cutting something and melting something—for example, living and hearing (recall Introduction, §1, on the difference between incomplete and complete changes; and see *Θ*6, 1048^{b}18–35, with Commentary, Chapter 6, §§6, 7). Yet living is as much a way of being actual as cutting (those who live a human life are thereby actual humans). Second, there are ways of being that are not in any obvious way 'doings' at all: being a house or a statue. Applying the notion of actuality to these cases is extending it beyond the initial application to changes—nevertheless there is some way in which I am saying the same sort of thing about the cutting saw as about the living human or the erected house when I cite them all as cases of *actual being*. What is more, I will get at a notion of *potential being* which extends beyond what possesses a capacity to produce changes by directing attention to what stands to a living human or an erected house in the way that the capacity to cut stands to the saw in action. The core of the Frede approach is that I do not introduce something new with this notion of *potential being*, over and above the capacities I started with. Rather I extend a notion by analogy from the cases I originally started with—capacities to produce change—to new cases (see Commentary, Chapter 6, §2, on Aristotle's appeal to analogy).

Do Aristotle's remarks at 1045^{b}32–1046^{a}4 on the structure of *Θ* support the Frede approach over the Ross approach? While readers should consult Frede's original presentation (Frede 1994) for an extended and persuasive exposition of his approach, four points about the present passage are noteworthy:

(i) At 1046^{a}1–2 Aristotle says that potentiality and actuality 'extend more widely' than to the cases concerning change, which suggests that potentiality applies *both* to the cases concerning change (the subject of Chapters 1–5) *and* to other cases in addition (which come to the fore in Chapters 6–9).

(ii) Aristotle's characterization of the initial discussions in *Θ*1–5 as 'not the most useful for what we want now' (1045^{b}36–1046^{a}1) might seem surprising if, as the Frede approach would have it, the material on capacities is already a consideration of potential being. However, it could be argued there is a metaphysical view lying behind

this comment according to which natural living things are among the most important items in the Aristotelian universe. At an early stage in Aristotle's thought they themselves were substances, the most basic entities (e.g. *Cat.* 5, $2^{a}11-14$); and, while the ontology of the later books of *Metaphysics* is rendered more complex by the form/matter distinction, natural living things retain a privileged position (compare *Met. Z*2, $1028^{b}8-13$, with *Z*16, $1040^{b}5-16$, and recall Introduction, §6). Such things are actual by virtue of living. For example, a horse is fully actual in living the life of a fully mature specimen of its kind (compare *GC* 1.3, $318^{b}25$; *An.* 2.4, $415^{b}13$; *EN* 9.4, $1166^{a}4$: for living things, to be is to be alive). And living, unlike house building or learning, for example, is not an incomplete change directed at an end outside itself. So the earlier discussion of capacities for change may not straightforwardly cover the cases of actual and potential being which are the most significant for Aristotle, and so may not fulfil the promise with which *Met. H* closed (*H*6, $1045^{b}16-23$), that attention to the notions of actuality and potentiality will clarify the vexed issue of the unity of items which contain both form and matter.

(iii) In the course of explaining why an examination of potentiality and actuality should start by looking at capacities, Aristotle says that potentiality applies 'most properly' to cases concerning change ($1045^{b}36$). Later he makes a correlative point about actuality (*Θ*3, $1047^{a}30-1$). Those remarks both support and cause problems for the Frede approach. On the one hand, they suggest that it is the *same* notion which applies (most properly) to capacities-changes and more widely in *Θ*6–9. On the other hand, they raise a difficult question: why are the applications to change the most proper? The claim about actuality, at least, could not possibly reflect any features of common Greek usage, since the term is an Aristotelian neologism (Introduction, §4).

(iv) The Frede account of the structure of *Met. Θ* generates expectations about the direction Aristotle's discussion will take in Chapters 1–5, and the fact that the expectations are borne out favours the approach. On any account, the central theme of *Met. Θ* is the general distinction between the actual and the potential. One important reason, according to the Frede approach, to focus initially on capacities is that they provide an accessible instance of potential being. So we would expect that Aristotle's main concern in Chapters 1–5 will be to show how capacities as instances of

potential being are related to the changes which are their exercise and which stand to capacities as the actual to the potential. The discussion which follows in *Θ* 1–5 takes precisely this direction (see Introduction, §1). It culminates in *Θ*5 in a careful account of the way in which capacities—the potential—give rise to changes—the actual. Further, the need to provide such an account determines the material which has to be covered in preceding chapters. Given what Aristotle wants to say in *Θ*5, he first has to clarify two distinctions, between non-rational and rational capacities, and between one-way and two-way capacities, and to show how those distinctions relate to one another (*Θ*2). And *Θ*3–4 are a defence of the contrast between the realms of the possible and the actual, which is manifest in the distinction between capacities and the changes they give rise to. On the Ross approach, in contrast, it is less clear why such a large proportion of *Θ* should be given over to a detailed consideration of capacities for change, and how in particular that extended discussion of capacities (powers) casts light on the quite distinct notion of potentiality.

Finally a point of translation. I have used the single word 'change' for two distinct Aristotelian terms, *kinêsis* and *metabolê*. For example, 'change' translates *kinêsis* (or cognates) at *Θ*1, 1046^{a}2; *Θ*2, 1046^{b}17, 21, 22; *Θ*3, 1047^{a}28, 31, 32, 33, 35; *Θ*5, 1048^{a}2; but the term *metabolê* (or cognates) at *Θ*1, 1046^{a}11, 12, 15; *Θ*2, 1046^{b}4. Aristotle does elsewhere draw significant distinctions by means of this pair of terms. Nevertheless he does not make anything of the distinction in *Θ*, and an alternative rendering of one of these terms (for example, as 'motion') would have resulted in a less natural translation.

3. 1046^{a}4–9: Marking out the Subject Matter

Aristotle's intention is to investigate potential being by concentrating initially on capacities for change. Preparatory to providing an organized account of the various cases which count as capacities for change, he needs to exclude any cases to which the term *capacity/potentiality* applies in only an accidental way.

Aristotle describes such cases as 'those that are called potentialities homonymously' (1046^{a}6). What Aristotle means by homonymy is explained at *Cat.* 1, 1^{a}1–6, where his preference for characterizing things rather than words as homonyms is clear. Take a

non-Aristotelian example. A small burrowing mammal with poor vision, a blemish on the skin and a massive stone pier are all moles, but they are moles only homonymously. If one were to explain what it is for each of these to be a mole, the explanations would be different. Failure to identify, and exclude, homonyms before giving an account of a concept would mean that no organized account could be provided. Failure to recognize that certain items are moles only homonymously would spell disaster for any biological investigation into the nature of moles. It is merely accidental that 'mole' covers just what it does, whereas it is not accidental that a single Greek term *dunamis* applies to the variety of cases Aristotle will present at $1046^{a}9–19$.

The back reference at $1046^{a}5–6$ ('we have shown elsewhere') is to *Met.* Δ12. Aristotle there pointed out the use of 'potentiality' (*dunamis*: more appropriately translated as 'power') in mathematics ($1019^{b}33–4$; compare Plato's pun at *Politicus* 266a–b: human beings are like the diagonal in that each has the power of two feet). Aristotle's text here is very compressed and hard to follow. Commentators do not agree on the number of homonymous cases Aristotle has in mind. Some take him to be indicating just one, that of powers in geometry: but it is hard to see how 'because things are or are not in a certain way' ($1046^{a}8–9$) is relevant to that case. Others discern two cases, in line with Δ12: first the geometrical application (as Δ12, $1019^{b}33–4$); second, that modality for which whether something *can* be the case follows from whether it *is* the case (as Δ12, $1019^{b}22–33$). This makes 'because things are or are not in a certain way' easier to understand, and, while it sits less well with the text as it stands, it is probably the better alternative. If Aristotle is identifying two homonymous cases, then the second would be that described at *Met.* Δ12, $1019^{b}34–5$, as what is possible (*dunaton*), though not in accord with a capacity (*dunamis*). It would be natural for Aristotle to exclude such a modality before offering an account of capacities (recall Introduction, §3, on the distinction between standard and non-standard modalities).

4. $1046^{a}9–19$: The Focal Analysis

A number of different types of capacity remain to be considered, once homonymous cases have been excluded. Initially Aristotle identifies three:

(i) Active capacities (1046ª11): the capacity something possesses to bring about a change in something else—for example, the capacity fires possess to heat pans of water placed upon them. Aristotle adds the qualification 'or in itself *qua* something else' to distinguish between changes due to such active capacities and changes due to something's own nature. (Recall Introduction, §5, on the distinction between capacities and natures, and its significance for *Metaphysics Θ*.)

(ii) Passive capacities (1046ª11–12): the capacity something possesses to have a change brought about in it by something else—for example, the capacity water possesses to be heated. The qualification 'or by itself *qua* something else' is added here for the same reasons as the corresponding qualification in the case of active capacities.

(iii) 1046ª13–15: the capacity something has to resist being changed to its detriment (as adding salt to meat preserves it in edible condition), or to resist being destroyed (as the composition of marble enables it to resist being eroded by wind and rain).

Further, parallel to each of these there is another capacity whose exercise is a *good* instance of the exercise of the corresponding unqualified capacity (1046ª15–16):

(iv) The eminent surgeon has the active capacity to cure his patients well (with a minimum of discomfort, rapidly, etc.), in contrast to the junior doctor who cures them merely adequately.

(v) Certain foods have the passive capacity to be well digested, in contrast with others which can be digested only partially or with difficulty.

(vi) A certain kind of stone resists harsh weather well (with barely any markings, etc.), in contrast to another which becomes weather-beaten, but does not crumble away.

Finally there are distinctions among incapacities corresponding to these distinctions among capacities (1046ª29–31; see §7 below).

According to Aristotle these different types of capacity are related in a determinate way. One of them—the active capacity, (i) —is the primary type, and characterizing any of the others involves some

reference to that primary type (1045^{a}15–16, 17–19; at 1046^{a}9 these capacities are introduced as those which 'relate to the same type'; see also the end of *Met.* Δ12, 1019^{b}35–1020^{a}6).

This is a common and sophisticated Aristotelian account of a way in which different cases can be covered by the same term. It allows Aristotle something more than the dichotomy between homonymy and synonymy. An example of homonyms was given earlier (§3): burrowing mammals, blemishes and piers are all homonymously moles; what it is for each of them to be a mole is different. In contrast, collies, alsatians and dalmatians are synonymous instances of dogs: what it is for each of them to be a dog is the same—for example, to have a certain chromosomal structure, or to have certain canine capacities (for Aristotle's characterization of synonyms see *Cat.* 1, 1^{a}6–12: both the name and the definition of being corresponding to the name are the same in the various cases).

Since Aristotle distinguishes between homonymy and synonymy by reference to the definitions corresponding to the term, there is logical space for a third category between homonymy and synonymy—cases in which the definitions are neither the same, nor merely different, but related in some structured way. A favourite example of Aristotle's is health (*Met.* Γ2, 1003^{a}34–1003^{b}1). Animals, diet, complexion, and weather can all be healthy. What it is for an animal and a diet to be healthy is not the same (so these are not synonymous cases of health); but nor are they merely and accidentally different (so they are not homonymous either). Rather, explaining what it is for a diet to be healthy involves reference to an animal's being healthy (a healthy diet is one that conduces to a healthy animal); and so, too, in the other cases (a healthy complexion is one that indicates a healthy animal, etc.). That is, one of the cases is primary and a focus for the other secondary cases. Hence analyses which provide such a structure of non-synonymous instances have come to be known as *focal* analyses (due to Owen: see the seminal discussion in Owen 1960 (see also Owen 1986: ch. 10)).

Aristotle offers focal accounts in a number of cases. See, for example, *Met.* Γ2, 1003^{a}33–4, 1003^{b}5–10 (being: compare *Met.* Z1, 1028^{a}10–31, and a back reference at Θ1, 1045^{b}27–32); *Met.* Γ2, 1003^{b}1–3, *Met.* Z4, 1030^{a}35–1030^{b}3, *MM* 2.11, 1209^{a}24–7, and *EE* 7.2, 1236^{a}18–23 (medical); *Met.* Γ2, 1003^{b}4 (unspecified reference to other cases); *Met.* Δ6, 1016^{b}6–11 (one); *Met.* Δ16, 1022^{a}1–3 (complete, final); *Met.* Z4, 1030^{b}4–7 (definition, essence); *EN* 1.6,

1096^{b}26–29 (conjectured for good); *MM* 2.11, 1209^{a}21–31, *EE* 7.2, 1236^{a}16–18, 23–33, 1236^{b}23–6 (friendship).

I will mention four points concerning Aristotle's claim that a focal account can be given of the different types of capacity, with active capacities serving as the focus.

(*a*) It may not be immediately obvious how the primary case of an active capacity occurs in the characterization of the other cases. Aristotle's view is that, in saying, for example, what a passive capacity is, it will be necessary to refer in some way to an active capacity (1046^{a}15–16, 17–19). The focal analysis is explicitly illustrated only for (iii), the capacity something has to resist being changed for the worse. The description of that case reads, in part, 'not being liable to be acted on . . . *by an origin of change*' (1046^{b}13–15), where the italicized phrase is (part of) the definition of the primary case of active capacity (1046^{a}10–11).

However, the most interesting of the secondary cases is not (iii) but (ii), passive capacities. For it is the relation between passive and active capacities which Aristotle treats at some length later in the chapter (1046^{a}19–29): and it is the interaction between agent and patient which is important in *Θ* 5. Why then should the definition of passive capacities involve any reference to an active capacity? 1046^{a}11–13 characterizes a passive capacity as follows (omitting the qualification 'or [by itself] *qua* something else', for brevity):

[PASS] the origin in what is itself affected of being changed and acted on by something else.

And [PASS] does not mention active capacities. But [PASS] as it stands is not an adequate definition of a passive capacity, because it does not really explain what is characteristic of central examples of passive capacities. To possess a passive capacity is not to be indiscriminately changeable—as [PASS] might suggest—but to be sensitive in particular ways to the influence of particular types of thing. Cold water possesses a passive capacity to be heated. There are many things which produce no effect on the temperature of cold water—for example, rocks and wool—but that is irrelevant to the passive capacity in question. What is significant is that cold water can be heated *by a certain type of thing*; and what is common and peculiar to those things which can bring about the appropriate change (fires, gas rings, electric kettles) is that they all possess an active capacity

to heat, correlative to water's passive capacity to be heated. In order to accommodate that point [PASS] should be supplemented as:

[PASS*] the source in what is itself affected of being changed and acted on by something else, i.e. the appropriate sort of *origin of change in something else*.

The italicized supplementation here does import the definition of an active capacity. So the primary case of an active capacity occurs in (an expansion) of the definition of the secondary case, a passive capacity. The treatment of the less important cases (iv)–(vi) will be similar.

(*b*) However that strategy gives rise to a problem, since it can be paralleled for active capacities. The definition of an active capacity is ($1046^{a}11$, with omissions for brevity):

[ACT] an origin of change in something else.

An active capacity is not a capacity to produce changes indiscriminately though. Fire, for example, has an active capacity to burn in that it is a source of combustion in other things. But it is not just *anything* which can be affected in that way by fire (for example, paper and cloth can be, gold and water cannot). What characterizes the objects which can have changes brought about in them by fire's active capacity to burn is that they possess the correlated passive capacity, i.e. are combustible. So, in order to capture the discriminatory character of active capacities, [ACT] should be supplemented as

[ACT*] an origin of change in something else, i.e. what possesses the appropriate sort of *origin of being affected by something else*,

where the italicized supplementation imports the definition of a passive capacity.

But, if there is just as much reason to include reference to a passive capacity in the definition of an active capacity as vice versa, then Aristotle's decision to privilege active capacities as the primary focus lacks justification. The bare fact that the various types of capacity are neither homonyms nor synonyms is not itself sufficient to establish that *any* particular type of capacity should be identified as primary, since there can be cases where it is an arbitrary matter how such definitions are related to one another. For example, 'square' is used

neither synonymously nor homonymously of shapes and numbers. But either of those cases could be used to define the other. On the one hand, I could first define a square shape as an equal-sided rectangle; and then define a square number as one which numbers a series of dots which can be arranged in a square shape. Alternatively, I could first define a square number as one that can be obtained by multiplying some integer by itself; and then define a square shape as a plane figure whose area is measured by a number which is the square of one of its sides. What rules out treating active and passive capacities as similarly and arbitrarily interdefinable?

An obvious answer would be that it is a competent appreciation of the received use of language which fixes of a particular focal analysis that it is this application rather than that which is primary (compare *Top.* 6.10, $148^{b}16–22$: in giving accounts of homonymous terms one should be constrained by received usage). But this will be plausible only when it is plausible to hold that received usage fixes *anything* about the variety of cases in question. And, while received usage no doubt does fix something as regards friendship and health, for example, it is less clear that it does so as regards capacities.

Nor does it help—although it would be true—to point out that what Aristotle generally recommends in extracting conclusions from the data of received usage and the opinions of others is respect for *reputable* beliefs, where the beliefs which are reputable need not be the widely held beliefs of common sense, apparent to competent speakers of the language (for an example of this recommendation, see *EN* 7.1, $1145^{b}2–7$; for a definition of reputable beliefs, see *Top.* 1.1, $100^{b}21–3$). It may well be the case, for example, that only someone philosophically adept and sensitive can extract from linguistic usage concerning *being* the focal structure which takes substance as the primary case (*Met.* Γ2, $1003^{a}33–4$, $1003^{b}5–10$). But that is just to say that persuasive reasons, consistent with usage, can be provided as to why substance, rather than any other case, should be identified as primary. However, the problem about capacities is that there do not seem to be any persuasive reasons to treat active capacities as the primary case—and that problem can only be exacerbated by Aristotle's later claim that active and passive capacities are in a way the same capacity ($1046^{a}19–21$). Further discussion of this issue should await more detailed comment on Aristotle's views about the qualified identity of active and passive capacities (see §5 below).

(*c*) While the detailed focal account presented in this chapter is missing from *Met.* Δ12, the earlier chapter does end with a summary of the focal analysis. The status of active capacities as the primary case is expressed there in the remark that we attribute passive capacities to objects *because* other things have active capacities over them (Δ12, 1020^{a}2–3). For example, we say that water is capable of being heated, and attribute to it the passive capacity to be heated, *because* fire has the appropriate active heating capacity.

That remark suggests that what is characteristic of a passive capacity is that it is in some way *dependent* on an active capacity, that there is some way in which water has a passive capacity to be heated *because* fire has an appropriate active heating capacity. It is not necessary to decide precisely what that relation of dependence is. However, it is clear that it would need to be an asymmetric relation: that passive capacities are dependent on active capacities in some way in which active capacities are not likewise dependent on passive capacities, and that it would not equally be true to say that fire has an active capacity to heat water *because* water has some appropriate passive capacity. For it is the crux of the focal analysis that the relation of being-defined-by-reference-to is asymmetrical: passive capacities are defined by reference to active capacities, and not vice versa. The objection raised at (*b*) above, and illustrated by the 'square' example, was that Aristotle seemed unjustified in treating active and passive capacities asymmetrically.

However, the suggestion from *Met.* Δ12, 1020^{a}2–3, raises further difficulties. For the thought that there is an asymmetrical dependence of passive on active capacities is in tension with some of the ideas Aristotle appeals to in justifying his claim that active and passive capacities are distinct: in particular the thought that passive capacities exist in virtue of features of the patient in which they inhere, and likewise *mutatis mutandis* for active capacities (see §6 below on 1046^{a}22–8).

(*d*) Finally, Aristotle's identification of active capacities as the primary case is of great importance for his strategy in the remainder of *Θ*. The distinctions which follow in *Θ*2 between one-way and two-way, and between non-rational and rational capacities, are intended as subdivisions among *active* capacities. If that were not the case, then Aristotle would have no hope of establishing that the two distinctions coincide. Suppose that a veterinarian's rational medical

skill *is* a two-way capacity to heal and to harm animals. It seems obvious that a rational capacity like that can be exercised widely across the non-rational and inanimate world. Then there are sure to be non-rational animal patients who have a two-way passive capacity to be healed and harmed by the veterinarian. If that were not so, then there would be no call for the veterinarian to deliberate about whether to heal or to harm a particular animal (see further Commentary, Chapter 2, §§3, 4, 8).

5. 1046^{a}19–29: The Identity of Active and Passive Capacities

Aristotle's view of the relation between particular active and passive capacities is nuanced. He makes two claims:

[A] The (active) capacity to ϕ and the (passive) capacity to be ϕ-ed are a single capacity (1046^{a}19–20).
[B] The capacity to ϕ and the capacity to be ϕ-ed are distinct capacities (1046^{a}22).

Aristotle holds that [A] and [B] are consistent, because each holds only 'in a way' (1046^{a}19, 22). The requirement that [A] and [B] be consistent places significant constraints on their interpretation. I discuss [A] in this section, [B] in the next.

Aristotle's gloss on [A] is brief in the extreme. It seems merely to point out that something can be called *capable* in virtue of having either an active or a passive capacity. This requires expansion.

The obvious way to support [A] is by reference to some single item, associated with active and passive capacities, which will unify such pairs of capacities as fire's active capacity to heat and water's passive capacity to be heated. There are two types of unifying item which could be appealed to. The first would be some item *prior* to the capacities themselves, which underpins them, and the existence of which ensures that both the appropriate capacities exist together. For example, Ross, who takes this sort of approach, refers to facts, such as the single fact that fire can heat water, in virtue of which fire has an active capacity to heat and water a passive capacity to be heated, and which thus serves to unify the active and the passive capacity (see Ross 1924: i, pp. cxxiv–cxxv, ii. 241). The second type of unifying item would be something *posterior* to the active and passive capacity, something which is not guaranteed to obtain whenever the active and passive capacities exist. An appealing

candidate is the single change which is the exercise of both the active capacity and its correlated passive capacity: for example, the single rise in temperature which is the exercise of fire's active capacity to heat water and water's passive capacity to be heated by fire.

The second approach is preferable to the first, because the first unifies capacities far more strongly than the second: indeed too strongly for it to be an acceptable way of supporting [A]. The reason that the first approach unifies active and passive capacities so strongly is that it entails that active and passive capacities have to occur in correlative pairs: for example, that fire has the active capacity to heat water if and only if water has the passive capacity to be heated by fire. For, if fire has the active capacity to heat water, then it is a fact that fire can heat water, in which case water has the passive capacity to be heated by fire (and vice versa). In contrast, the second approach allows that something could have an active capacity without anything having the correlative passive capacity, for example, that craftsmen could have the capacity to build houses in the absence of any materials with the passive capacity to be built into houses—though it does require that, if the one capacity is exercised, so too is the other one.

The strong unification of active and passive capacities, the view that they have to occur in correlative pairs, is unacceptable because it is inconsistent with a number of other claims Aristotle makes about capacities.

(i) It is inconsistent with the view suggested by the focal analysis, that there is an asymmetric dependence of passive on active capacities (see §4(*c*) above). For, if active and passive capacities have to occur in correlative pairs, then there is a *symmetrical* dependence between them. If there is no active capacity, then there is no correlated passive capacity, and vice versa—water's having a passive capacity to be heated would be no more dependent on fire's having an active capacity to heat than vice versa.

(ii) It is inconsistent with a view appealed to later in support of [B], that a passive capacity exists in virtue of features of the patient in which it inheres, while an active capacity exists in virtue of features of the agent in which it inheres (1046^{a}22–6; see §6 below for detailed comment). For holding that active and passive capacities have to occur in correlative pairs entails that an active capacity equally depends on features of the patient in which the

correlative passive capacity inheres (and likewise *mutatis mutandis* for passive capacities). For anything which affects water's passive capacity to be heated will *ipso facto* affect fire's active capacity to heat. (In fact the view that Aristotle appeals to in support of [B]—that a passive (active) capacity depends crucially on features of the patient (agent) in which it inheres—is a general source of difficulty. For it is also inconsistent with the view mentioned above in (i), that there is an asymmetric dependence of passive on active capacities; see further §6 below).

(iii) Finally, it is inconsistent with an attractive reading of *Θ*5, 1048^{a}15–16 (see Commentary, Chapter 5, §10). Aristotle's point there is that external conditions will not be relevant to something's *possession* of a capacity, but they will be relevant to whether it is *possible* that something exercise a capacity: for instance, a cobbler retains his capacity to make shoes even if there is no suitable leather available for him to work with, but in such circumstances it is not possible for him to exercise his capacity and make a pair of shoes. (The view that features *internal* to an object are relevant to its possession of a capacity, while features external to it are not, is also in line with the examples Aristotle provides at *Met. Θ*3, 1047^{a}1–2, of the conditions under which capacities are lost, as well as being appealing to common sense). The inconsistency arises because, if active and passive capacities have to occur in correlative pairs, then there can be conditions external to the bearer of (say) a passive capacity which will be relevant to the continued possession of that capacity: namely, any features of agents relevant to their continued possession of the correlated active capacity. Global changes in wheat sufficient to render it no longer digestible (e.g. widespread pollution, making it poisonous to us) will ensure that we no longer have the capacity to digest wheat, if wheat's passive capacity to be digested and humans' active capacity to digest wheat have to co-occur.

So there are reasons not to support [A] by reference to something prior to correlative active and passive capacities. In contrast, the second way of supporting [A], according to which correlative active and passive capacities are unified by something *posterior*—namely, their common exercise—avoids all these problems. Since it is no longer the case that active and passive capacities have to occur in correlative pairs, this way of supporting [A] does not generate inconsistencies (i)–(iii). Of course, the inconsistency pointed to in

(ii), between the focal analysis and the support about to be offered for [B], does remain—but that is a problem about the focal analysis, rather than about [A].

Further, this second way of supporting [A] connects [A] in an attractive way with other Aristotelian positions. The view that correlative active and passive capacities have a common exercise is endorsed by Aristotle elsewhere (see *Phys.* 3.3). It is a view which supports [A] by means of the strong intuition that an important part of what determines the identity of a capacity is what its exercise is: this intuition is also manifest in Plato's claim that capacities are identified by the effects they produce and the objects they apply to (*Republic* V, 477c–d). So to the extent, for example, that this (active) capacity and that (passive) capacity have the same exercise, there is reason to treat them as one and the same capacity. Of course, more is relevant to capacity identity than capacity exercise, and so their having the same exercise will not establish that they are unqualifiedly the same capacity. But that is a welcome consequence, since Aristotle holds only that they are 'in a way' the same, while also being 'in another way' different (1046^{a}19, 22).

6. 1046^{a}19–29: The Diversity of Active and Passive Capacities

Aristotle offers fuller support for his second claim about active and passive capacities:

[B] The capacity to ϕ and the capacity to be ϕ-ed are distinct capacities (1046^{a}22).

The structure of his argument is fairly clear. [B] follows from the fact that active and passive capacities are differently located; and the bulk of 1046^{a}22–9 is devoted to establishing two claims about the location of capacities:

(i) The passive capacity to be ϕ-ed is in the patient which is ϕ-ed (1046^{a}22–6).
(ii) The active capacity to ϕ is in the agent which ϕs (1046^{a}26–8).

How should talk of capacity location be understood? It might be thought to be something utterly transparent, needing no further explication. But Aristotle does not treat it in that way: the parenthetical remark at 1046^{a}22–6 ('for it is because it has a certain origin . . .') comprises argument in support and expansion of the

claim (i), that a passive capacity is located in the patient—and exactly parallel considerations would be relevant in the case of active capacities and agents.

The argument at $1046^{a}22–6$ suggests the following gloss on (i). A passive capacity (e.g. the capacity to be heated) is located in a particular type of patient (e.g. water), because it is crucially due to facts *about water* that the passive capacity exists: and, in general, a capacity is located in those objects such that it is facts about those objects which fix whether the capacity exists (note the use of 'because' at $1046^{a}22$). That is why Aristotle supports (i) by citing the type of features in virtue of which something has a passive capacity, and leaving us to notice that those features are features *of the patient*—for example, wax has the passive capacity to be burned because wax is oily, food tins have the capacity to be crushed because they yield to pressure in a certain way.

It should be noted that there is nothing here to suggest that Aristotle thinks that being oily, for example, is a material basis which is *identical* to the capacity to be burned, or more generally that he takes capacities to be identical to categorical bases. The reference to matter at $1046^{a}23$ is not essential to Aristotle's point, and is offered merely as one example of an origin in the patient in virtue of which it has a passive capacity. Further, the notion of matter—like the notion of potentiality with which it is linked—is applied widely by Aristotle, and encompasses more than the stuff of which something is made (*Met.* H6, $1045^{a}33–1045^{b}2$; *Θ*8, $1050^{b}20–2$, 27–8); so we cannot draw any strong conclusions here about the relation of capacities to material bases. In any case, other examples could have been given of non-material (formal) features of patients in virtue of which they have a passive capacity (for example, it is in virtue of their shape that footballs can be moved forward by a player's boot); and it is not in fact clear whether the second example Aristotle offers refers to formal or material factors (the patient's yielding under pressure might be due not to the stuff it is made of, but to its weak shape). All that Aristotle requires for his purposes here is that whatever features are adverted to are indeed features of the patient.

Claim (ii) is merely stated, though the considerations which would support it are obvious, and parallel to those which support (i). It is due to features of fires and human beings that the one has the active capacity to heat and the other the capacity to build.

As noted at §5 above, the view which underpins (i) and (ii)—that passive (active) capacities exist in virtue of features of the patient (agent) in which they inhere—is inconsistent with holding that there is an asymmetrical dependence of passive on active capacities. For, according to the former view, it is *neither* the case that passive capacities depend on active (since the passive capacity exists in virtue of features of the patient, and not in virtue of those features of the agent on which the active capacity depends), *nor* the case that active capacities depend on passive (since the active capacity exists in virtue of features of the agent, and not in virtue of those features of the patient on which the passive capacity depends).

This problem is generated by a significant tension in Aristotle's thought about active and passive capacities. On the one hand, Aristotle wants to treat active and passive capacities similarly, arguing that active and passive capacities depend each in the same way (whatever that is) on agent and patient respectively: for he appeals to the same reasons for locating active capacities in agents as for locating passive capacities in patients. On the other hand, the tendency of the focal analysis is to treat active and passive capacities differently, positing an asymmetrical dependence of passive on active capacities, corresponding to the secondary status of the former and the focal status of the latter.

It follows, then, that the problem is not to be resolved simply by arguing that a capacity could be dependent *both* on features of its bearer *and* on features of objects other than its bearer. That view may well be true. Consider first the case of passive capacities. Let it be granted that there is no inconsistency in holding, for example, that grass is digestible (has a passive capacity to be digested) by cows *both* because of its cellular structure *and* because of the structure of the bovine digestive system in virtue of which cows have an active capacity to digest grass. Granting that would have the plausible consequence that widespread changes *either* in the constitution of grass *or* in cows would result in grass losing its passive capacity to be digested. But that move would go no way towards resolving the present problem. For it will now seem arbitrary not to admit, for example, that cows have an active capacity to digest grass *both* because of the structure of the bovine digestive system *and* because of the cellular structure of grass. And, once that is admitted, the passive capacity (of grass to be digested) is no more dependent on the active capacity (of cows to digest grass) than vice versa.

7. 1046ª29–35: Incapacity and Privation

The closing section of the chapter is extremely condensed, and summarizes material from two chapters of *Met.* Δ: 1046ª29–31 on incapacity should be compared with Δ12, 1019ᵇ15–21, and 1046ª31–5 on privation with Δ22 (for comments, see Kirwan 1971). The closing comments about privation, 1046ª31–5, are particularly crabbed, and considerable expansion is required to produce a readable translation.

Aristotle's main point here concerning incapacities is that the different notions of incapacity and being incapable parallel the different notions of capacity distinguished earlier (see examples (i)–(vi) in §4 above). The phrases 'for the same thing' and 'in the same respect' at 1046ª30–1 refer to the content of a capacity and the objects which can be affected by the exercise of a capacity. Aristotle's claim is, for example, that corresponding to the capacity to heat water (possessed, for example, by fires) there will be an incapacity to heat water (possessed by blocks of ice).

The discussion in *Met.* Δ12 adds slightly more detail to 1046ª29–31, providing an example to illustrate the different ways in which things can be called incapable (1019ᵇ18–19: it would be in different ways that a boy, a eunuch, and a man are incapable of fathering children—the first because of immaturity, the second because of mutilation, the last because of ill health). But it does not expand directly on the claim that different notions of incapacity parallel different notions of capacity.

The parallelism is best understood and supported with reference to the discussion of privation in *Met.* Δ22. Aristotle there provides increasingly stringent conditions which have to be satisfied in order that something's non-possession of a feature should count as lacking the feature, or as a privation. At the most minimal, it is sufficient that possession of the feature is natural to some things, even if not to this thing (it is in this way that a plant lacks sight (1022ᵇ22–4)). At the other extreme are a number of relevant qualifications (for example, a man does not count as a dwarf, as deprived of stature, if he is small only *relative* to a giraffe, a child who does not have knowledge of geometry *in the way* that an expert would will not count as ignorant, namely, lacking in knowledge). Two of Aristotle's comments on privation in *Met.* Δ22 are particularly relevant to the incapacity/capacity parallel. First, we will characterize something

privatively if it possesses a feature only to a very minimal degree (1022^{b}36–1023^{a}2: for example, someone with very few hairs is bald); and, second, something is described privatively if it cannot act or be affected easily or properly (1023^{a}2–4: for example, someone who can detect sound, but cannot hear properly, make out words, etc., will be called deaf; stones that can be shifted only with great difficulty and effort will be called immovable). According to *Θ*1, 1046^{a}29–30, an incapacity is the privation of a capacity. So we should be able to read different types of incapacity off from the various notions of privation which Aristotle distinguishes in *Met. Δ*22. For example, it is not just the wholly untrained novice who is incapable of healing (this sort of incapacity corresponds to the definition of an active capacity at 1046^{a}11); a student doctor with a minimum of medical training, who cannot heal properly, will also be incapable of healing (a type of incapacity corresponding to the active capacity to achieve an outcome well (1046^{a}15)). Again, it is not just material which passes through the body wholly unaffected which is indigestible (an incapacity corresponding to the basic passive capacity defined at 1046^{a}11–12), but also food which cannot easily or properly be digested (corresponding to passive capacities to be affected well (1046^{a}15–16)).

CHAPTER 2

1. An Overview of the Chapter

This chapter builds on *Θ*1's focus on active capacities, and introduces two distinctions among active capacities: that between rational and non-rational capacities ($1046^{a}36$–$1046^{b}4$), and that between two-way and one-way capacities ($1046^{b}4$–7). Three claims are then established concerning the relation between these two ways of dividing up capacities:

[A] If a capacity is rational then it is a two-way capacity.
[B] If a capacity is non-rational then it is a one-way capacity.
[C] A two-way capacity is not indifferently related to the opposed outcomes to which it can give rise.

[A] is stated with illustrations at $1046^{b}4$–5, 6–7 (medical skill can give rise to both health and disease); [B] with illustrations at $1046^{b}5$–6 (heat can give rise only to heating). [C] is stated at $1046^{b}11$–12. Arguments for [A]–[C] are run together throughout $1046^{b}7$–15.

At $1046^{b}15$–24 Aristotle states (and argues briefly for) correlative claims about the agents which possess rational or non-rational capacities ($1046^{b}18$–20 on the agent that is hot, and the agent possessing medical knowledge). He adds a further point at $1046^{b}22$–3, that an agent's exercising two-way capacities depends on there being objects possessing one-way capacities (for example, the doctor skilfully uses various medicines, each of which has only a one-way capacity, in order to produce health or disease: in the absence of those one-way capacities the doctor's agency would be severely restricted).

The chapter closes with some disconnected remarks ($1046^{b}24$–8) on the relation between the capacity for doing something well and the capacity for doing something *simpliciter*. These notions were distinguished in the preceding chapter ($1046^{a}16$–19).

2. The Translation of *logos*

The Greek term *logos* is central to this chapter. This word admits of a variety of translations, which fall into two main groups:

(i) Something external or expressed: a *logos* as an account, definition, or specification; more generally, argument, discussion, discourse; speech or language. Giving a *logos* of health would be specifying what health is; a *logos* of health would be an account of (the nature of) health.
(ii) Something internal, the psychic capacity which is manifest in grasping or providing a *logos* in sense (i): *logos* as reason, rationality, thought.

Aristotle uses *logos* in four related contexts in *Θ*2.

First, *logos* is used to pick out different parts of the soul: some origins of change are in that part of the soul which has *logos* ($1046^{b}1$; compare *EN* 1.13, $1102^{a}26–1103^{a}3$, on the parts of the soul). Second, capacities are divided between those associated with *logos* and those which are not ($1046^{b}2$, 5–6), according as the capacities are in the part of the soul which has *logos* or not ($1046^{a}36–1046^{b}2$). In both these contexts *logos* is best translated along the lines of (ii) as *rational*. A cognate translation is used at *Θ*5, $1047^{b}34$ (some capacities are acquired by habit and *logos*) and $1048^{a}2$, 3, 13 (rehearsing the *Θ*2 distinction among capacities, as also at *Θ*8 $1050^{b}34$).

The third context in *Θ*2 is in connection with knowledge: $1046^{b}7–8$: knowledge is *logos*; $1046^{b}16–17$: knowledge is a capacity in that it involves possession of a *logos*. The fourth context is one of the crucial premisses of this chapter: $1046^{b}8–9$: the same *logos* clarifies both a positive and a privation; $1046^{b}12–13$: the *logos* concerns one opposite *per se*, the other not *per se*; $1046^{b}20–1$: the same *logos* is of both of a pair of opposites. In these cases I translate in line with (i) as *account*. The same translation is used in connection with the focal analysis at *Θ*1 ($1046^{a}15–16$, 18–19: the account of the primary capacity; $1045^{b}31$: the account of substance), and in the *Θ*8 discussion of priority in *logos* ($1049^{b}11$, 12, 16–17: priority in account). There are related (i)-type translations at *Θ*1, $1045^{b}32$ (the earlier discussions), *Θ*3, $1047^{a}19–20$ (arguments), *Θ*8, $1049^{b}27–8$ (the discussions about substance), $1050^{b}8$ (the reason, i.e. argument), $1050^{b}35$ (people in the arguments), and *Θ*10, $1051^{b}13–14$ (the same statement).

How do these different uses of *logos* in *Θ*2 fit together? The position in outline is as follows. One part of the soul is rational ($1046^{b}1$ has *logos*). So the capacities located in the rational soul

are also rational (1046^{b}2: associated with *logos*). The bodies of productive expertise which are craft knowledge involve grasping an account of their subject matter (1046^{b}20–1: possession of a *logos* in the soul). Since the soul is an origin of change (1046^{b}17), and since the grasp of a *logos* of something involves rationality (a tree or a fish can be healthy, but they cannot understand what health is), these bodies of knowledge are central examples of rational capacities (1046^{b}2–3). And, since the same account applies, in different ways, to a positive and a privation (1046^{b}8–9, 12–13, 20), capacities involving a grasp of that account, and agents with those capacities, will be able to produce both positive and privation (1046^{b}4–5, 10–12, 19–20). I comment in more detail on that outline in what follows.

3. 1046^{a}36–1046^{b}4: Capacities and the Soul

This opening passage is relatively straightforward. Its purpose is to introduce one of the two distinctions with which this chapter will be working: that between rational and non-rational capacities.

Aristotle makes four points in this passage, whose logical relation to one another calls for some comment:

(i) Some origins of change are found in what is soul-less, others in the rational part of the soul (1046^{a}36–1046^{b}1).
(ii) Some capacities are non-rational, others are rational (1046^{b}1–2).
(iii) All crafts are capacities (1046^{b}2–3).
(iv) Crafts are origins of change in something else (1046^{b}3–4):

The chapter starts from (i); (ii) is supported by (i), ('since' and 'it is clear' at 1046^{a}36, 1046^{b}1); (i), (ii), and (iv) together explain why (iii) is true ('that is why' at 1046^{b}2, 'for' at 1046^{b}4).

The focal notion of an active capacity as an origin of change in something else (or in the bearer considered as something else) was given in *Θ*1 (1046^{a}10–11). Aristotle now points out that capacities are attributed to different types of bearer, and in virtue of different features of those bearers. First capacities are divided according as their bearers are non-living (for example, acids have the capacity to corrode metals) or living (1046^{a}36–7). He then identifies the class he is interested in by considering the location of capacities whose bearers are alive: first those *in the soul*, and then those of them which

are in the *rational part* of the soul ($1046^a37–1046^b1$). A capacity is located in the (rational) soul if a bearer possesses the capacity in virtue of being alive (rational). The claim that something possesses a capacity *in virtue of* being alive is stronger than the claim that the bearer is *in fact* alive, and there are capacities whose bearers are in fact alive but which are not located in the soul. In such cases the capacity is not lost when the bearer dies: both living trees and dead trees are combustible, both living fish and dead fish are edible. In contrast, an animal's capacity to reproduce is *in the soul*: it is possessed in virtue of being alive, and is lost on death. The capacity to prove geometrical theorems is *in the rational part of the soul*: it is possessed in virtue of being rational.

The distinction Aristotle is concerned to draw is between capacities possessed by rational living things, in so far as they are rational (for example, my capacity to write English), and all the others. The former class are rational capacities, the latter non-rational.

Aristotle is modest in claiming (iii), that crafts are capacities *simpliciter*. That follows simply from (iv), that crafts are origins of change, coupled with Chapter 1's account of the focal case of active capacities as origins of change. The preceding (i) and (ii) entitle him to the stronger claim that crafts are *rational* capacities (since they are possessed by living rational agents in so far as they are living and rational).

Why does Aristotle bother to assert (iii)? One reason is just that crafts (for example, medical skill) will be his paradigm example in what follows of two-way, rational capacities. The other, more interesting, reason concerns the argument which will follow ($1046^b15–24$), about the way in which rational craft capacities are used to achieve their various effects. It is important for that argument that a craft capacity be located in the rational part of the soul ($1046^b20–1$), since it is that claim about location which secures the further crucial result that in so far as someone possesses a craft capacity she will have a common understanding of a positive outcome (for example, health) and its privation (for example, disease), and can instigate opposed courses of action. (For more on this see §8 below.)

4. $1046^b4–7$: One- and Two-Way Capacities

Having distinguished among capacities between rational and non-rational capacities, Aristotle states the central thesis of the chapter.

Rational capacities can give rise to opposed outcomes: a single rational capacity is a capacity for opposites (1046^b5). A skilled doctor can use her medical expertise both to heal and to harm—for example, by prescribing certain drugs or letting certain conditions run their course ($1046^b6–7$). In contrast, a particular non-rational active capacity gives rise to only one outcome (this is stated in compressed fashion at $1046^b6–7$, with an example following at $1046^b7–8$). The only effect that heat will produce on something is to make it hotter; an acid will only ever turn litmus solution red. Aristotle's claim, stated briefly, is that rational capacities are two-way, while non-rational capacities are one-way capacities. Before Aristotle's arguments for this claim can be assessed, it is necessary to explain the distinction between one-way and two-way capacities more clearly.

It is best to start with the simpler case of one-way capacities. Aristotle's example at 1046^b6 (heat produces only heating) suggests an initial naive account of what it is for a capacity to be one way:

(i) A capacity to ϕ is a one-way capacity iff any and every exercise of the capacity is an instance of ϕ-ing.

But (i) is unsatisfactory as it stands. It faces two sets of problems, the first of which are more easily accommodated. A non-rational capacity often gives rise to a plurality of effects on a single occasion—indeed Aristotle elsewhere offers an extended treatment of the different ways in which things are hot, and in which they heat and cool (*PA* 2.2, $648^b11–649^b8$). In some cases the different effects to which something hot gives rise will be merely various but consistent (a hot oven will not only heat the dough put into it but also cause it to change colour and increase in size). In other cases a causal chain may be initiated in which contrary effects occur successively. The sun can in a way bring about cooling, if it heats me up, my pores open, I sweat, and I cool down (Aquinas, *Comm. in Met.* §1789). Alternatively a single capacity may produce opposed effects simultaneously: the sun causes ice to become fluid but moist clay to dry out (*PA* 2.2, 649^a30: also Lucretius, *de Rerum Natura* VI.962–9, Scotus, *Quaest. in Met. IX* q.15). In all these cases, however, there is some privileged or proper effect (the dough, my body, the ice, and the moist clay are all heated). The other effects involved are either concomitant (the dough changes colour as it heats up), later stages in a single causal chain (I am heated and as a result sweat and as

a result cool down), or stages in different causal chains concerning different objects (when ice is heated it melts, when moist clay is heated it becomes more brittle). The idea of a privileged or proper effect could be captured by amending (i) to:

(ii) A capacity to ϕ is a one-way capacity iff any exercise of the capacity is (at least *inter alia*) an instance of ϕ-ing.

However, (ii) requires further amendment in face of a second set of more intractable problems.

Capacities are important in explanation (recall Introduction, §5: see *Met. Θ*1, 1046^{a}10–11, a capacity is an *origin* of changes; and *Met. Γ*2, 1003^{b}24, *Δ*1, 1013^{a}16–17, on the significance of origins for causal explanation). In order that appeal to a capacity should be explanatory, it is important that a single capacity should be identifiable in a range of different circumstances. It is relatively unexplanatory of a range of outcomes (such as bread being cooked, butter melting, water boiling, clay solidifying ...) to appeal to a distinct capacity for each distinct case (for example, the capacity to cook bread, the capacity to melt butter). What is explanatory is unifying appeal to the general capacity to heat. That is why we will often identify the exercise of a capacity in non-standard cases: it is *one and the same* natural capacity in a tree which explains its growing straight and tall in open country and explains its gnarled and twisted growth when it is hemmed in by other plants, *one and the same* natural capacity in a salmon which explains its progress upstream for spawning and its thrashing about when trapped in a rockpool. But in that case it follows that there need not be any single effect which occurs in every exercise of a particular non-rational capacity. For example, the same natural capacity of a heavy object is sometimes exercised in motion, sometimes in stationary deformation of a shelf.

So (ii) needs to be amended in order to include some reference to the conditions in which a one-way capacity is exercised. There is a three-way distinction among conditions relevant to the exercise of a capacity: *normal*, *interfering*, and *preventative* (or *blocking*) conditions. These three notions are interdefined. Normal conditions are those in which nothing either interferes with or prevents a capacity being exercised. In interfering conditions a capacity may be exercised but its exercise is non-standard. In preventative (blocking) conditions no exercise of a capacity takes place at all. Consider a bee's natural capacity to pollinate a foxglove (a non-rational capacity,

since bees lack the power of reason; and so according to Aristotle a one-way capacity). *Normal* conditions for the exercise of that capacity are that the bee is healthy, with pollen on its legs, and that the foxglove is open and sufficiently large for the bee to reach the stamens. If the bee exercises its capacity in normal conditions, it will pollinate the foxglove (among other effects, since it may also disturb other insects, cast shadows, etc.). Examples of *interfering* conditions are that the bee is unusually large, or the flower is unusually small. In that case, any exercise of the capacity will be non-standard, and the bee may *inter alia* reach the stamens, but deposit the pollen in the bell of the flower. *Preventative* conditions would be, for example, that the bee is trapped in a spider's web, or the flower is closed. Under those conditions the bee will be unable to do anything, and the capacity will not be exercised.

In order to obtain a satisfactory characterization of one-way capacities, (ii) should be amended to:

(iii) A capacity to ϕ is a one-way capacity iff any exercise of the capacity in normal circumstances is (at least *inter alia*) an instance of ϕ-ing.

The notion of a two-way capacity is then explained by contrast with (iii):

(iv) A capacity to ϕ is a two-way capacity iff there can be exercises of the capacity in normal circumstances which are not (even *inter alia*) instances of ϕ-ing.

A two-way capacity can be specified in terms of just *one* of its outcomes (as a capacity to ϕ) because a two-way capacity is not indifferently related to the opposed outcomes to which it can give rise (see further §7 below). On examination, (iv) is a good account of what is significant about a paradigmatic two-way capacity, such as medical skill ($1046^{b}6–7$). If a doctor exercises this capacity in harming his enemy (for example, skilfully prescribing drugs which he knows will precipitate collapse), there need be nothing in the conditions in which he acts which *interfered* with his healing the man, and nothing entails that those conditions are not normal conditions for exercising the healing capacity. As Aristotle explains later in *Θ*5, the healing capacity is exercised through an act of poisoning because the doctor *desires* to harm his enemy and *chooses* to do so (*Θ*5, $1048^{a}10–11$). It would be quite wrong to think of

that desire and choice as something *interfering* with the exercise of the capacity to heal. Contrast the case of a well-meaning doctor who is striving to heal, but working with adulterated drugs, and whose patient dies. In that case there is an exercise of the capacity to heal (the doctor's medical knowledge leads him to prescribe such and such treatment), and death results because adulterated drugs interfere (this point will be important later in assessing a claim about the bad outcomes of a capacity at *Θ*9, 1051^{a}18–19; see Commentary, Chapter 9, §4).

In what follows I will use the unwieldy *contra*-ϕ as a term of art for the secondary exercise of a two-way capacity to ϕ. This is to avoid misunderstanding. A doctor counts as *non-healing* even in situations in which she is not exercising her medical skill at all: she is lying asleep in bed, or writing letters in her surgery. But for a doctor to be *contra-healing* requires an exercise of her skill to bring about harm. It will sometimes be possible, as regards particular capacities to ϕ, to say more specifically what contra-ϕ-ing would consist in: for medical skill it is harming. But often this will not be possible: in the case of building skill *contra-building* will cover the skilful construction of walls which will collapse precipitately and the expert dismantling of buildings. (See §7 below: the fact that exercises of the capacity to ϕ in contra-ϕ-ing typically exhibit more variety than those in ϕ-ing is significant for Aristotle's claim that a two-way capacity is not indifferently related to its opposed outcomes.)

5. 1046^{b}7–15: Aristotle's Argument about Rational Capacities

Aristotle makes two claims:

[A] If a capacity is rational, then it is a two-way capacity.
[B] If a capacity is non-rational, then it is a one-way capacity.

Before proceeding, note that there are two passages later in *Θ* in which Aristotle appears to allow that even non-rational capacities are, in some attenuated sense, associated with opposed effects. First, at *Θ*8, 1050^{b}33–4, which seems to refer back to *Θ*2, there is the difficult remark that non-rational capacities are associated with opposed outcomes by being present in one sort of object, absent from another (see Commentary, Chapter 8, §13, for fuller discussion).

The second passage is *Θ*9, 1051^{a}4–17. Its relation to the endorsement of [A] and [B] in *Θ*2 is subtle. On the one hand, the argument

at *Θ*9 relies on the general principle that every potentiality is for opposed outcomes (*Θ*9, 1051^{a}5–6, 10–11, 16–17). The principle is stated very abstractly in *Θ*9. It takes no note of *Θ*2's distinction between rational and non-rational capacities; and it covers both active and passive capacities, while *Θ*2's treatment of [A] and [B] concerns the focal case of active capacities, identified at *Θ*1, 1046^{a}9–19. On the other hand, the examples Aristotle provides in *Θ*9 to illustrate the general principle dovetail nicely with *Θ*2. He mentions a variety of passive capacities (1051^{a}7–10: being healthy and being diseased, remaining at rest and being changed, being built and collapsing); the only active capacity mentioned is—in *Θ*2's terms—rational (1051^{a}9–10: building and demolishing). There are no examples of the type which would cause problems for *Θ*2: active non-rational capacities. What is more, the claim that all *passive* capacities are for opposites is not merely consistent with, but is arguably entailed by, [A] and [B]. For active rational capacities are exercised on patients. If a builder can both build and demolish, then there must be things which are both buildable and demolishable. If a doctor can choose whether to heal or to harm in a particular case, then there must be people who are both healable and harmable. For further discussion see Commentary, Chapter 9, §§3, 4.

Are [A] and [B] plausible? Of the two, Aristotle pays far more attention to [A] than to [B] in *Θ*2. Indeed, it is quite hard to find premisses in Aristotle's text which are directly relevant to [B]. That is unfortunate, since it is [B] that is likely to strike a reader as the more contentious claim. Further, the difficulty of extracting clear arguments for [A] and [B] from 1046^{b}7–15 is exacerbated because Aristotle is also concerned to establish a third claim in the course of the passage:

[C] A two-way capacity is not indifferently related to the opposed outcomes to which it can give rise.

It is easier to disentangle Aristotle's discussion if we initially consider just [A] and [B]. I look first at [A], and then in §§6–7 at [B] and [C] respectively.

An argument for [A] along the following lines can be assembled from Aristotle's text. There is an appealing intuitive distinction between genuine and pseudo two-way capacities. If that distinction is to be preserved, it is necessary to specify a further condition on a capacity's being a genuine two-way capacity. Any rational capacity

will satisfy that further condition. So, as [A] claims, any rational capacity is a (genuine) two-way capacity.

A doctor can heal or harm patients; a magnet can attract or repel other magnets. But the intuition is that only the doctor has a genuine two-way capacity. In contrast, what is attributed to the magnet is a pseudo two-way capacity, and is more properly a pair of one-way capacities co-instantiated in a single bearer. It is essential that Aristotle should be able to justify this intuition if he is to have any hope of establishing [A] and [B], that all and only two-way capacities are rational. For it is perfectly clear from Aristotle's criteria (1046^a36–1046^b2) that all a magnet's capacities are non-rational, and so they had better not count as two-way capacities.

The intuition can be justified. It is reasonable to say that the magnet's capacity is merely a pseudo two-way capacity because there is a way of further specifying the objects over which it applies which matches exactly the difference between the effects to which the capacity gives rise. The effects are: attracting other magnets and repelling other magnets. And the field over which the capacity applies splits into two disjoint groups (Fs and Gs) such that the one effect *can* be exercised only over the Fs and the other *can* be exercised only over the Gs. The only magnets it is *possible* for a magnet to attract are those presenting an unlike pole; the only magnets it is *possible* for it to repel are those presenting a like pole. That is why the putative two-way capacity, to ϕ and contra-ϕ, fractures into a pair of one-way capacities, to ϕ Fs and to contra-ϕ Gs.

The case of the doctor's capacity to heal and harm is quite different. There is no further way of dividing up the field over which that capacity applies into two disjoint groups, such that one is the field of the capacity to heal and the other is the field of the capacity to harm. Those the doctor has the capacity to heal are the very same as those he has the capacity to harm. (Recall Introduction, §3, and see Commentary, Chapter 5, §10, on the distinction between A's having the *capacity* to ϕ and its being *possible* that A ϕ. There may be a way of dividing patients into those that it is and those that it is not *possible* for a doctor to heal, the curable and the incurable; but the existence of incurable patients does affect a doctor's medical capacity—just as, if the lights are off, it is not possible that I see, but I do not lose my visual capacities and go blind. A doctor exercises his capacity to heal on the incurable Candy by making her as well as

it is possible to make her, which unfortunately is not very well at all: see *Rhet.* 1.1, 1355^{b}12–15.)

So, if the capacity to ϕ and ψ is to be a genuine two-way capacity, then ϕ and ψ must be sufficiently unified that there is a *single* capacity applying over a single field, while sufficiently distinct that it is a *two-way* capacity: ϕ and ψ must be so related that, for any object you like, something has the capacity to ϕ that object if and only if it has the capacity to ψ that object. The magnet's capacity to attract and repel fails this condition; the doctor's capacity to heal and harm satisfies it.

The argument for [A] is that any rational capacity will satisfy this further condition. It is scattered through Aristotle's text:

(i) A rational capacity to produce ϕ is a capacity to bring about ϕ which is grounded in possessing an account of what ϕ is (1046^{b}2–3: crafts are bodies of knowledge; 1046^{b}16–17, 20–21: knowledge involves possessing and internalizing an account; 1046^{b}17, 21: such knowledge is a capacity to produce effects because the soul can originate changes).

(ii) An account of what ϕ is will also be an account of what the privation of ϕ is (1046^{b}8–9: the same account clarifies both positive and privation; repeated 1046^{b}20, 24); so a reasoned understanding of what ϕ is—that is, possession of an account of ϕ—will also be a reasoned understanding of what the absence or privation of ϕ is: knowledge of what health is and how to achieve it will inevitably be accompanied by knowledge of what disease is, and how to achieve states of disease.

(iii) So a rational capacity to bring about ϕ will also be a capacity to bring about the privation of ϕ (1046^{b}10–11: bodies of craft knowledge are of opposites).

(iv) ϕ and its privation are related in just the way required of the effects of a single two-way capacity: they are distinct, but unified by there being a common account of a positive—for example, health—and its privation—for example, disease.

(v) So any rational capacity will be a genuine two-way capacity (1046^{b}4–5, 6–7): a single capacity to bring about opposite effects, rather than a pair of one-way capacities with opposed outcomes.

6. 1046^{b}7–15: Aristotle's Arguments about Non-Rational Capacities

[B] is more problematic than [A]. It seems vulnerable to counter-example, and it is harder to find arguments for it in Aristotle's text.

First, some apparent counter-examples. Suppose a tree absorbs oxygen from the air under certain conditions (for example, when the concentration of atmospheric oxygen rises above a certain threshold), and releases oxygen into the air under contrary conditions (when the concentration of atmospheric oxygen is below that threshold). Then it appears that the tree has a two-way capacity, to absorb and to release oxygen, sometimes exercised one way and sometimes another (just as a doctor has a two-way capacity to heal and to harm, exercised in healing when he chooses to heal and in harming when he chooses to harm). Or again, suppose human embryos developed in this way. Sex differentiation is not fixed from the outset by sperm and egg; after initial fertilization of an egg by a sperm, there follows a brief period of development in which no sex differences exist; then some random occurrence within certain cells in the developing embryo fixes whether subsequent changes lead to a male or a female baby. In that case a newly fertilized egg would have a two-way capacity, to become a male human and to become a female human. In the face of such apparent counter-examples, are there any Aristotelian arguments in support of [B]?

One approach to [B] would to be to show that it follows from other Aristotelian views. That would explain why Aristotle held [B], and perhaps why he would dismiss apparent counter-examples. Another approach would be to defend [B] directly, and to show that, contrary to appearance, no non-rational capacity could be a genuine two-way capacity. Of the arguments below (i) is an instance of the first approach; (ii) is an independently appealing adaptation of an Aristotelian route to [B]; (iii) is an argument which appeals to premisses found in *Metaphysics Θ*2.

(i) Aristotle has a general view of paradigm cases of agent causation which would make [B] extremely attractive to him. The general view is a transmission model of agency. Suppose an agent A changes a patient B from non-F to F: for example, an electric ring changes a pan of water from cold to hot. Aristotle views A's action on B as the transmission of some form F from A to B. Initially B is potentially F. After it has been affected by A, B is actually F (something which can be hot is actually hot, after being heated up). A, in contrast, must have been actually F before the change in B (it is only *hot* electric rings which heat up water), and may remain actually F after the change (stoves are cooled down in heating up pans of water, but red

apples do not become less red in making us see red). So there is a general description of A's action on B: A makes B like itself in respect of the property (F) by virtue of which A produces a change in B. (For Aristotelian statements of this position, see *Phys.* 3.2, 202^{a}9–12; *GC* 1.7, 324^{a}8–14; *An.* 2.5, 417^{a}19–21; *GA* 2.1, 734^{a}30–3; see also *Met.* Θ8, 1049^{b}24–5; Aristotle sometimes suggests limiting the scope of the transmission model (*Met.* Z9, 1034^{a}21–5, 1034^{b}16–19). For discussion, see Lloyd 1976; Mourelatos 1984; Denyer 1990: ch. 10; Makin 1990.)

Given this general view, *any* two-way capacities pose an apparent problem. If A has a two-way capacity it can, in appropriate circumstances, cause some things to become F and other things to become non-F. But on the transmission account that would suggest, *per impossibile*, that A was at the same time both actually F (in so far as it gives rise to F results) and actually non-F (in so far as it gives rise to non-F results).

Now if the capacity in question is a rational capacity, this problem is *merely* apparent. For, according to Aristotle, having a rational capacity to ϕ is possessing an intellectual understanding of the form transmitted in acts of ϕ-ing (having the form 'in the mind' as it were: see, for example, *Met.* Z7, 1032^{a}32–1032^{b}23); and grasp of that single form equips an agent to bring about both ϕ-ings and contra-ϕ-ings (see further §5 above on [A]).

However, if the capacity is a non-rational capacity, the problem posed is genuine and intractable. For in that case there is no other way for an agent to bring about both ϕ-ings and contra-ϕ-ings than by itself being, for some form F, actually both F and non-F. And, since that is impossible, [B] follows: no non-rational capacity is a two-way capacity, so every non-rational capacity is one way.

(ii) Of course we do not now think it a general truth about the agent–patient relation that agents assimilate patients to themselves. However, the argument in [i] can be adapted. For we *do* think that, when A produces a change in B, there is some causally efficacious property F of A in virtue of which it does so. Where we part company from Aristotle is on the view that the change A produces in B is generally describable as making B itself F.

Now there are two ways in which an agent A could introduce the efficacious property F—whatever it is—into a causal situation: either

(*a*) by itself being F: manifesting the property F,
(*b*) by introducing a representation of F: encoding the property F.

For example, (*a*): sulphuric acid (A) produces a change in zinc (B), and does so in virtue of its molecular structure (F); and that molecular structure is introduced to a causal situation by being manifest in a sample of sulphuric acid. In contrast, (*b*): a cook (A) changes the constitution of certain ingredients (B) in certain ways, in virtue of the recipe guiding his actions (F), and that recipe is introduced to the situation by being encoded in the cook's mind.

If an efficacious property is introduced to a situation as represented in an agent, as (*b*), then that agent must have certain rational abilities: either to carry the representation himself (as with the cook), or to read the representation from something which does carry it (as with the builder reading a plan). So the agent requires some understanding of the way in which F initiates certain sequences of changes (say to G); and it then follows that the agent will be able to initiate opposing changes (to non-G outcomes), since the same understanding will enable him to use F appropriately so as to ensure that a sequence resulting in G does not ensue (the cook's understanding of the recipe enables him to ensure that the cake comes out flat). That is Aristotle's first claim [A]: if the agent's capacity is a rational capacity, it will be a two-way capacity.

In contrast, the only way a non-rational agent will be able to introduce an efficacious property to a situation is by manifesting the property, by itself being F. But in that case the agent will not possess a two-way capacity, to initiate changes to G and non-G outcomes. Suppose that A's being F sometimes leads to B's becoming G and sometimes to B's becoming non-G. Then it would not be A's being F which was the origin of, say, B's change to G, since the property F is no more an origin of changes to G than to non-G outcomes. This argument supports Aristotle's second claim [B], that, if a capacity is non-rational, then it is a one-way capacity.

(iii) While the lines of support offered so far for [B] appeal to broader Aristotelian ideas, they have not made any obvious reference to premisses to be found in *Θ*2. The following argument does rest on a premiss stated at 1046^{b}15–16: 'opposites do not occur in the same thing.' It would be pleasing if that premiss did function in an argument for [B], since otherwise its role in *Θ*2 would be unclear.

There is an important difference to notice between rational and non-rational capacities. In *Θ*5 (1048^{a}10–11) Aristotle argues that a rational capacity such as the medical craft requires some deciding factor in order to issue in action: the doctor has to *choose* to heal (harm) before his medical skill will issue in healing (disease). That deciding factor plays two roles as regards a rational capacity. First, it *activates* the capacity (so that it issues in *some* outcome); second, it *directs* the capacity to one or the other of its two possible outcomes (so that it issues in *this* outcome rather than that).

First, the *activating* role of choice is clear if we reflect that a doctor's medical skill, for example, is essentially constituted by an understanding of what health is, and a consequent grasp of the steps required to achieve states of health. A crippled doctor who retained that understanding, who could not administer treatments himself, but who could guide others, would retain his medical skills. Such a doctor would be an origin of changes in his patients (1046^{b}3–4; compare *Phys.* 2.3, 195^{b}21–5: he is most properly a cause in virtue of his grasp of the form of health. This is consistent with Aristotle's remarks at *Θ*3, 1047^{a}1, on the loss of capacities: the reference there to misfortune could cover, for example, accidents that render a doctor comatose). Consider a doctor, faced with a patient, who has not yet decided whether to exercise his skill in healing or harming—perhaps he cannot tell whether the patient is his bitter foe or an innocent party. In that case *neither* healing *nor* harming will result. Yet the doctor clearly does not lack any rational capacity to heal, any understanding of the nature of health: he lacks rather the activation of his capacity by choice (compare *An.* 3.9, 433^{a}4–6). Second, the *directive* role of choice, on which Aristotle concentrates in *Θ*5, is required in order to ensure that the capacity issues in just one outcome and not in healing and harming at the same time.

A non-rational capacity, in contrast to a rational capacity, is self-activating. In *Θ*5 Aristotle argues, for example, that, of necessity, if a fire has the capacity to heat some water, and the circumstances are right for that capacity to be exercised, then the capacity is exercised. No further factor is required for its exercise, whereas the indecisive doctor mentioned above could be in the right circumstances to heal (or to harm) without his medical capacity being exercised at all.

That difference between rational and non-rational capacities underpins an argument for [B]. Suppose that there could be a non-rational two-way capacity. If that were so, then something would be

required to *direct* the capacity, on any occasion of its exercise, to one or the other of its possible outcomes: a pair of states that the bearer of the capacity could be in, such that one directs the capacity to one exercise and the other directs it to the other. However, since the capacity is non-rational, those directive states will play no activating role. The capacity is *ex hypothesi* non-rational and therefore self-activating and, of necessity, is exercised in the right circumstances.

That imposes a condition on these directive states. They have to be such that it is *guaranteed* that an agent possessed of the capacity will be in one or another of those states in any circumstances which are right for the capacity to be exercised. For, if that were not *guaranteed*, then it would be *possible* that an agent should be in the right circumstances, and be in neither directive state (just as a doctor can be in the right circumstances to exercise his skill, and be undecided between healing and harming). Now, according to Aristotle's own test for possibility (*Met.* Θ3, 1047^{a}24–6), if that were possible, then nothing impossible would follow if it actually obtained. But something impossible would follow in this case: if the agent were in neither directive state, though in the right circumstances for the exercise of its non-rational capacity, the capacity would (as a self-activating non-rational capacity) issue in both opposed effects at once, and that is impossible (hence the premiss at 1046^{b}15–16).

So it must be guaranteed that when in the right circumstances for the capacity under consideration to be exercised the agent is in one or another of these two directive states. What could guarantee that? There are two alternatives: either the circumstances themselves, or the agent itself, could fix that the agent is in one directive state or the other. The first alternative corresponds to the first putative counter-example mentioned earlier, the tree which absorbs and releases oxygen. The second corresponds to the second, the fertilized egg which at a certain stage goes male or female depending on some occurrence in its cells.

If neither of these alternatives is consistent with our original supposition—that there be a *capacity* which is both *non-rational* and *two way*—then we will have established Aristotle's claim [B] that, if a capacity is non-rational, then it is one way.

The first alternative is that the *circumstances* fix that the agent is in one or other of the directive states. In the case of the tree, it is the concentration of oxygen in the air around it which fixes either that the tree is in an inner state such that it absorbs oxygen or in an

inner state such that it releases oxygen. But in that case it does not seem that it is the *agent* (the *tree*) which is the origin of the changes which come about. Those changes originate from the circumstances in which the 'agent' is located, while the 'agent' is little more than a channel for the causal influence of those circumstances. For example, the tree is merely registering and responding to changes in oxygen levels, and is no more an origin of those changes than is a thermostat an origin of changes in air temperature. But, if the 'agent' is not properly an origin of the changes which ensue, then there are no grounds to suppose that the agent has any *capacity* as regards those changes, since a capacity is essentially an *origin* of changes (*Θ*1, 1046^{a}10–11; *Θ*2, 1046^{b}3–4; *Θ*8, 1049^{b}5–10). So, this would not be a case of something possessing a *capacity* which was both *non-rational* and *two way*.

The second alternative is that something about *the agent itself* guarantees that it is in one or other of the directive states. For example, at a certain stage in the development of the fertilized egg some random occurrence within the developing embryo fixes its subsequent development as male or as female. That directive occurrence would have to be random, since if it were fixed in its turn by some preceding state it would be that *earlier* state which was properly directive of the embryo's developmental capacities. However, in that case the subsequent male or female developments do not properly originate from the fertilized egg itself, but are effects of random changes within that egg. The subsequent development as male or as female originates from that directive occurrence, and that directive occurrence does not originate from anywhere. Since the relevant capacity would be an origin of whichever sexual development occurred, and since a random sexual development would have no origin (would 'come out of nowhere'), once again we have no grounds for attributing to the egg a *capacity* which is both *non-rational* and *two way*.

So in neither case have we retained the supposition that there is a capacity which is both non-rational and two way, and that supports [B]: if a capacity is non-rational then it is a one-way capacity.

7. 1046^{b}7–15: Aristotle's Arguments about Privations

A third claim Aristotle wants to establish is:

[C] A two-way capacity is not indifferently related to the opposed outcomes to which it can give rise.

[C] is expressed in technical terms at 1046^{b}11–13: the doctor's skill, for example, concerns health '*per se*', disease 'not *per se*' but 'in a way incidentally'. [C] seems initially plausible. A doctor's medical skill can give rise to both healing and harming, but it is more properly a capacity to heal than to harm. However, the fact that [C] looks uncontentious case by case is not very interesting. For that fact does not establish whether or not the case-by-case application of [C] reflects merely empirical features of particular cases. For example, it is in fact the case that medical students are trained to make people healthy, that medical knowledge developed in response to people's desire to be healthy rather than their desire to harm their enemies, and so on—and, given such empirical facts, medical skill is more properly a capacity to heal than to harm. If [C] reflected only such empirical facts about individual two-way capacities, it would be less engaging of our attention.

On the other hand, [C] would be extremely interesting if it embodied a deeper conceptual claim. Given how medical skill actually developed through human history, it is *in fact* more properly a capacity to heal than to harm. But could it have been different? Could there have been a two-way capacity which equipped its bearers to bring about both health and disease, but which was more properly a capacity to harm than a capacity to heal? Is it a merely empirical fact that there is no such capacity, or is there something in the nature of the two outcomes (for example, health and disease) in virtue of which there could not be such a capacity?

Aristotle's view that there is a common account which covers the opposed outcomes of a two-way capacity would lead him to take [C] as making the deeper non-empirical point. It is because the capacity to erect a house (at least) requires grasping an account of houses, understanding what a house is, that the expert builder is also an expert demolisher. In that case [C] will make a conceptual, rather than a merely empirical, point so long as it is grounded in an asymmetry concerning the way in which the common account applies to the opposed outcomes, which asymmetry is itself conceptual.

The relevant asymmetry, according to Aristotle, is that the account applies to one outcome *in itself*, and to the other *incidentally* (1046^{b}12–13: the phrase *in a way* may suggest some hesitancy about the appropriateness of this terminology). These terms themselves admit of a variety of meanings (see *Met.* Δ18 and Δ30). The point here is this. A certain account elucidates the nature of disease

because disease stands in a certain relation to health (1046^{b}13–15: it is the negation of health). But it is different if we ask why that same account clarifies the nature of health: it clarifies health because health is what it is, rather than because health is related to something else. (On *because of itself/because of something else* as a meaning of *in itself/incidentally*, see *An. Post.* 1.4, 73^{b}10–16, esp. 73^{b}10–11, 13–14; *Met.* Δ18, 1022^{a}32–5; *Met.* Δ30, 1025^{a}21–5.)

It follows, then, that [C] will make a conceptual, rather than a merely empirical, point so long as that relation between health and disease *could not* have been reversed: so long as there *could not* have been an account which clarified disease in itself, and health indirectly. Here Aristotle is on strong ground. To give an account is to gather a range of cases together under a common definition. The account will apply *in itself* if the cases it gathers together are intrinsically unified. For example, the various states that count as healthy all have this in common: they conduce to the flourishing of the organism in the face of typical environmental change. An account will apply *incidentally* if all that unifies its extension is its relation to something else; for example, the various states that count as disease have in common only that they are *not* healthy states, they do *not* conduce to the organism's flourishing. Now consider all those cases which are in fact gathered together as instances of disease: could there be some account which unified those cases without relating them to—by contrasting them with—those which are in fact gathered as cases of health? One might reasonably expect not. It is plausible to suppose that it is never a contingent feature of a kind (states of disease; or non-red things) that all that unifies the kind is a contrastive relation to some other kind (states of health; or red things). We *have to* explain being-diseased or being-non-red as a failure to be healthy or to be red; we *cannot* reverse this, and explain being healthy as a failure to be diseased, being red as a failure to be non-red. This is because—roughly—the one kind (for example, disease) is indeterminate relative to the other (for example, health); because what counts as disease exhibits far more variety than what counts as health; because there are far more ways to be diseased than to be healthy, and to be non-red than to be red.

It is hard to state the intuition operating here entirely clearly. But it is certainly an intuition found elsewhere in Aristotle. Compare, for example, *EN* 2.6, 1106^{b}28–35, on the asymmetry between success and failure: in a particular case failure is possible in many

ways, success in only one, which is why it is easier to be vicious than virtuous, and why virtue is a mean between vices. The same intuition lies behind the inclusion of *good*, *one*, and *determinate* in one column of the Pythagorean table of opposites, *bad*, *plurality*, and *indeterminate* in the other (see *Met.* *A*5, 986^{a}24–6, for Aristotle's full list of the Pythagorean opposites; *Phys.* 3.2, 201^{b}25–7: what is listed under one column of the table of opposites is indeterminate because it is privative; the connection of *good* with *determinate*, *bad* with *indeterminate*, is related to Aristotle's claim that every craft capacity properly aims at a good (*EN* 1.1, 1094^{a}1–2)).

8. 1046^{b}15–24: Rational and Non-Rational Agents

This section is complementary to 1046^{b}7–15, in which [A] and [B] are established. [A] and [B] are claims about *capacities* (1046^{b}5–7: *heat* produces only heating, *the medical craft* produces disease and health). Aristotle now turns to correlated claims about the bearers of capacities: 1046^{b}18–20: what is wholesome (for example, a certain amount of food), what can heat (for example, a fire), what can cool (for example, ice), someone who has knowledge (for example, a doctor). It is, however, quite a delicate matter to state the relevant claims correctly.

It will not do to talk simply of rational and non-rational agents. A rational agent will possess many non-rational capacities (a doctor has the non-rational capacity to heat, in virtue of his body temperature); and a single non-rational agent could possess a pair of capacities which individually issue in opposed effects (consider a combination fan and convector heater, which brings about both cooling and heating). It is better to talk of an agent considered just in so far as it possesses a rational (non-rational) capacity. Such an item is to be referred to by means of a description which includes reference to the capacity in question: for example, as something wholesome (some food, considered just in so far as it has the capacity to produce health; not in so far as it has the capacity to produce a certain taste), someone who has knowledge (some human, considered just in so far as she has the capacity that is knowledge; not in so far as she has the capacity to heat or to move). Some abbreviation is useful in stating the correlatives to [A] and [B]. By *an agent qua* ϕ*-er* I mean an agent considered just in so far as it possesses the capacity to ϕ. I speak of an *agent qua rational* when the capacity

to ϕ is a rational capacity, and an *agent qua non-rational* when the capacity to ϕ is a non-rational capacity. Aristotle's 'someone who has knowledge' is an agent *qua* rational, his 'what can heat' is an agent *qua* non-rational. The phrases 'what is capable in accordance with an account' and 'what is capable without an account' at 1046^{b}22–3 are Aristotle's way of referring to objects in so far as they possess a rational or non-rational capacity. The same object (for example, Candy) could be an agent-*qua*-rational (in so far as she possesses the capacity to build) and an agent-*qua*-non-rational (in so far as her body temperature enables her to heat). Just so, Aristotle's 'someone who has knowledge' could also be 'what can heat'.

Aristotle wants to make three points:

[D] An agent *qua* rational can bring about opposed effects (in normal circumstances).
[E] An agent *qua* non-rational can bring about only one (proper) effect (in normal circumstances).
[F] An agent *qua* rational brings about opposed effects by use of agents *qua* non-rational.

Once stated in this way, and given [A] and [B], the first two claims at least are straightforward and require little explicit argument. Most of 1046^{b}15–24 explicates [D]. Someone with knowledge has a rational capacity (1046^{b}16–17: knowledge is a capacity involving possession of an account); a living thing can initiate action (1046^{b}17, 20: the soul has an origin of change); so a living thing possessed of a rational capacity will be able to initiate opposed effects. Although opposed, these effects can be attributed to a single agent: they are unified, first by arising from a single origin, the rational capacity (1047^{b}21–2, 24), second by the common account which covers them (1047^{b}22, 24).

Claim [E] is merely stated with examples (1046^{b}18–19), and does not require supporting argument.

Claim [F], however, calls for comment. It may not be clear how [F] is to be found in the text. The lines 1046^{b}22–3 have puzzled commentators. Ross (1924: ii. 283) queries the dative phrase which I have translated 'by means of what is capable without an account' as spurious, and comments that it seems pointless; and the Ross–Barnes translation of 1046^{b}22–3 differs greatly from mine: 'and so the things whose potentiality is according to a rational

formula act contrariwise to the things whose potentiality is non-rational' (Bames 1984). However, translating the phrase as an instrumental dative allows the sentence to make a substantive point, concerning the way in which agents *qua* rational are able to give rise to opposed effects—namely, by skilled use of the appropriate agents *qua* non-rational (the doctor achieves health by applying this poultice, disease by administering that drug).

What [F] claims is that rational and non-rational capacities are not wholly independent of one another: in particular, there have to be agents possessed of non-rational capacities in order for rational capacities to be exercised. The following argument supports [F]. Imagine a world in which the only capacities possessed by agents are rational capacities. Any agent's capacities for sustained action would be severely limited. An agent's causal contribution would tend to be absorbed as soon as another causal agent entered the picture. Suppose A caused B to ϕ, and that caused C to ψ . . . Since all the causal capacities are rational, so far as A's input goes C could as well have contra-ψ-ed as ψ-ed. For B has a rational capacity to produce either of those effects in C, and so could have produced either effect consistently with A's affecting B. If rational agents can have little knowledge of the more remote effects of their actions, and cannot control how causal chains proceed, their ability to make reasonably complex plans of action will be limited, and their agency severely curtailed. So it is reasonable to hold [F], that rational agency requires the presence of agents possessing non-rational capacities.

9. 1046^{b}24–8: Acting Well and Acting *simpliciter*

This passage makes a self-contained point, concerning the relation between the capacity for ϕ-ing well and the capacity for ϕ-ing *simpliciter*. These capacities were distinguished earlier (*Θ*1, 1046^{a}16–19). Aristotle makes two claims:

(i) The capacity to ϕ *simpliciter* follows from the capacity to ϕ well (if someone possesses the capacity to ϕ well, then she possesses the capacity to ϕ *simpliciter*)
(ii) The capacity to ϕ well does not always follow from the capacity to ϕ *simpliciter* (it is not always the case that if someone possesses the capacity to ϕ *simpliciter* then she possesses the capacity to ϕ well).

Claim (i) looks uncontentious. But (ii) is more puzzling, since it might appear rather that possession of the capacity to ϕ well *never* follows from possession of the capacity to ϕ *simpliciter*. However, Aristotle's point is cogent. Capacities can be divided into two groups. In the one case ϕ-ing badly tends towards not ϕ-ing at all (if you make enough wrong moves on the chess board, it is not that you are playing chess badly: you are not playing chess at all, but just messing around with the pieces); and so possession of the capacity to ϕ (sufficiently) well does follow from possession of the capacity to ϕ *simpliciter*. The other case is not like this. For example, no matter how badly someone sees, they are still seeing, and eyesight that discriminates anything at all is still eyesight. In these cases possession of the capacity to ϕ well does not follow from possession of the capacity to ϕ *simpliciter*. It will be difficult to find a general principle by which to assign capacities to one group or the other. Cliam (ii) registers the two cases, and finesses further consideration of the matter.

CHAPTER 3

1. An Overview of the Chapter

This chapter splits into two main parts. The first (1046^b29–1047^a29) criticizes an anti-Aristotelian view of capacities. The second (1047^a30–1047^b2) comments on the term *actuality*.

The chapter starts with a statement of a position according to which there are never any unexercised capacities (1046^b29–30):

[M] Something possesses a capacity at *t* iff it is exercising the capacity at *t*.

Aristotle offers four arguments against [M]. An adherent of [M] cannot give an account of the acquisition and loss of craft capacities (1046^b33–1047^a4). [M] entails Protagorean relativism (1047^a4–7). Someone who holds [M] cannot provide an acceptable account of the non-craft capacities possessed by living things, such as the capacity for sight (1047^a7–10). [M] entails that nothing ever changes (1047^a10–17).

If [M] is false, then there is a genuine distinction between what something is capable of and what something is actually doing, and more generally a distinction between what is merely possible and what is actual (1047^a17–24). Accordingly Aristotle offers a test for establishing possibilities (1047^a24–6), with illustrative comment following (1047^a26–9): something is possible if and only if nothing impossible follows from supposing the putative possibility to be actual.

The chapter closes with some remarks on the term *actuality* (1047^a30–1047^b2). This final section is not well integrated with the rest of the material in the chapter. In expanding on the connection between actuality and change Aristotle is led to make some comment on the status of things which are not (1047^a32–1047^b2).

2. 1046^b29–32: The Megarian Argument

Aristotle gives a brief statement of the position he will argue against. It is likely that a number of views, of varying degrees of plausibility, are covered. The Megarians are identified only as representatives of the anti-Aristotelian position (1046^b29: 'There are some—such

as the Megarians . . .'). Aristotle does not give any positive grounds for his opponents' views. I will start by offering a plausible argument on behalf of Aristotle's opponents (hereafter referred to as the Megarians for convenience sake, and without historical commitment: readers more interested in Megarian thought should look at the collection of fragments in Döring 1972 and at Sedley 1977). The reconstruction which follows is expanded in Makin (1996).
The Megarian claim—

[M] Something possesses a capacity at t iff it is exercising the capacity at t

—follows validly from the following two premisses (where NP and S abbreviate *necessity of the present* and *synchronicity*):

[NP] If something does not act in a certain way at t, it does not at t have the capacity to act in that way at t.
$(\forall t)$ (A does not ϕ at $t \rightarrow$ A does not at t have the capacity to ϕ at t).

[S] All capacities are really synchronic.
A synchronic capacity is one such that: if something possesses at a time the capacity for acting at a time, the time at which it possesses the capacity is identical to the time specified in the content of the capacity.
$(\forall t)$ $(\forall t^*)$ (A has at t the capacity to ϕ at $t^* \rightarrow t = t^*$).

Now consider an example: Candy's possessing the capacity to work-through-Monday-lunch-hour. If [M] can be established first on the supposition that Candy does work through Monday lunch hour, and second on the supposition that she does not, then the Megarians have their position.

Suppose Candy does work through Monday lunch hour. When, if ever, does she possess the capacity to work-through-Monday-lunch-hour? According to [S], not at any time which falls outside Monday lunch hour, since no such time is identical to Monday lunch hour. On the other hand, Candy will possess the capacity to work-through-Monday-lunch-hour during Monday lunch hour, when she is in fact working-through-Monday-lunch-hour. So [M] holds: Candy possesses the capacity only when she is acting, and when not acting she does not possess the capacity.

Suppose alternatively Candy does not work through Monday lunch hour. When, in that case, does she possess the capacity to

work-through-Monday-lunch-hour? As regards times falling outside Monday lunch hour, the position is as above: according to [S], she will not possess at any of those times the capacity to work-through-Monday-lunch-hour. In addition, though, according to [NP] she will not possess the capacity during Monday lunch hour either, given that she is not then in fact working-through-Monday-lunch-hour. So again [M] holds: she possesses the capacity only when acting, and when not acting she does not possess the capacity (that is, since she does not act she *never* possesses the capacity).

3. Some Other Anti-Aristotelian Positions

It is most likely that Aristotle's actual target in *Θ*3 is someone who holds [NP] and [S], and therefore [M]. Aristotle's arguments in this chapter will be assessed only relative to that position. But it is worth noting that there are philosophically more plausible positions which are developments of that view, and which are still strongly anti-Aristotelian. I will mention two. Interested readers might consider whether Aristotle's arguments would be effective against these positions also.

The first position accepts [S], but allows, as a sop to common sense, that some capacities *seem* diachronic: that is, they appear to be capacities possessed at one time to act at a different time. It seems, for example, that a doctor can possess today the capacity to heal a patient tomorrow. But diachronicity is taken to be a superficial feature of capacities, to be explained away in terms of a principle such as

[D] For distinct t and t^* A is capable at t of ϕ-ing-at-t^* only if it is true at t that A will be capable at t^* of ϕ-ing-at-t^*.

A sleeping doctor can now have some capacity vis-à-vis healing. According to [D] he has *now* (in a derivative sense) the capacity to heal *tomorrow* so long as come tomorrow he will have *then* the capacity to heal *then*.

This is a striking position. Since [S] and [NP] entail [M], the doctor will have tomorrow the capacity to heal tomorrow only so long as he actually does heal tomorrow. So [S + NP + D] entail an account of capacities according to which someone now has the capacity to ϕ if and only if either she is ϕ-ing now or she will ϕ later. Diodorus Cronus, writing probably the generation after Aristotle,

defined the possible in temporal terms, as what either is or will be the case. The Diodoran definition was well known in antiquity, and might be seen as a development of a Megarian position in response to Aristotelian criticism (for further details on Diodorus, see Sedley 1977).

[S + NP + D] is an anti-Aristotelian position. If this doctor will in fact die in the night, and so will never heal again, he does not now have any capacities vis-à-vis healing, and if a cloak will in fact wear out rather than being cut up, it does not have the capacity to be cut up (*Int.* 9, 19[a]13–14: it seems that Aristotle disagrees—see also Commentary, Chapter 4, §2).

The second position is philosophically the most plausible of the 'Megarian' views. [NP] and [S] are not unmotivated assumptions. They are underpinned by a simple intuition about capacities (and about possibilities more generally):

[INT] Capacities can be exercised when they are possessed.
(Possibilities can be actualized when they obtain.)

[INT] is prima facie very appealing. The thought behind [INT] is that, since (put crudely) a capacity is a 'can do', then any capacity *can* be exercised. So, if a capacity is possessed *at a time*, it can surely be exercised *at that time*. If a capacity *cannot be* (rather than merely *is not*) exercised at a particular time, it may seem pointless to insist that it is nevertheless possessed at that time. Likewise as regards possibilities more generally. If something is possible it can be actual, so if something is possible *at t* then it can surely be actual *at t* (see §7 below on 1047[a]10–17 for the significance of the point about possibility; for further discussion and defence of [INT] see Makin 1996).

[S] does indeed follow validly from [INT]. But an astute adherent of [INT] might see that [NP] does not, and so could be dropped. The most appealing route from [INT] to [NP] would be the following. Suppose Candy is standing still at noon. Then Aristotle's Megarian opponents will allow that she possesses at noon the capacity to stand still at noon. Could she also possess at noon the capacity to walk at noon? It might seem that [INT] requires that, if she possessed *both* those capacities at noon, then she could exercise them both at noon. But, if she exercised them both at noon, then she would be both standing still and walking at noon, which is impossible. So [NP] would follow. Since Candy is not walking (but standing still)

at noon, then she does not possess at noon the capacity to walk at noon. However, that argument involves a scope fallacy. [INT] requires that, if Candy possesses at noon two capacities—to stand still at noon, to walk at noon—then *each* can be exercised at noon. But that leads to no impossibility: if she exercises the first she is standing still (not walking) at noon, if she exercises the second she is walking (not standing still) at noon. [INT] does not require that *both together* can be exercised at noon. That would indeed lead to impossibility—that she is both standing still and walking at noon—but it is not equivalent to the requirement that *each* can be exercised. The first requirement is of the form $\Diamond p \,\&\, \Diamond q$, the second of the form $\Diamond (p \& q)$.

Once [NP] is dropped, there is no barrier to allowing the possession of capacities which are never exercised. Even if Candy is not in fact healing at noon, nothing in [S + D] rules out Candy's possessing at noon the capacity to heal at noon. Further, given [D], Candy could in a derivative way have possessed in the morning the capacity to heal at noon—even if, come noon, she does not in fact heal.

Nevertheless [S + D] is an anti-Aristotelian position. It is driven by [INT], which is not part of Aristotle's conception of capacities: Aristotle will allow, for example, that someone may possess a capacity even when her situation renders it impossible for her to exercise it (see §9 below and Commentary, Chapter 5, §§10, 11). And it is inconsistent with any position which admits diachronic capacities that are not correlated with any later synchronic capacity. For example, according to [S + D], Candy could not now be in a state which endows her with the capacity to heal tomorrow if, come tomorrow, she not only fails to heal tomorrow, but also fails to retain the capacity to heal tomorrow: for example, Candy does not now possess the capacity to heal tomorrow if she will in fact die or be severely injured during the night.

4. $1046^{b}33$–$1047^{a}4$: Craft Capacities

Aristotle's first objection is that a Megarian cannot give an acceptable account of craft capacities, such as building or the medical art. Two features of craft capacities are significant:

(*a*) $1046^{b}36$–7: if someone possesses a craft capacity at a particular time, she must earlier have learned, or in some other way acquired, it.

(*b*) $1046^{b}37–1047^{a}1$: if someone possesses a craft capacity at one time, but at a later time does not possess that capacity, that loss calls for explanation; and the explanation can be drawn from only a fairly limited range of candidates.

There is an important characteristic of craft capacities underlying (*a*) and (*b*). A's possession of a craft capacity is an *intrinsic* (non-relational) property of A. That is why craft capacities are retained even when external factors prevent their being exercised. If there are no patients around, it is not possible that a trained doctor heal: but he does not thereby lose his healing capacity (compare *Θ*5, $1048^{a}15–16$, and Commentary, Chapter 5, §10). Two further points follow. First, since possession of a craft capacity is an intrinsic property of a bearer, acquisition or loss of a craft capacity constitutes a genuine change in the bearer, and therefore calls for explanation. Second, the explanation must appeal to some fact about the bearer. Passage $1047^{a}1$ specifies forgetting, misfortune, or time. An example of misfortune would be an accident rendering the craftsman comatose; 'time' refers to changes in the bearer due solely to the passage of time (for example, old age, infirmity); the puzzling reference to what 'the thing . . . that always is' at $1047^{a}2$ is probably to the form, internalization of which by the craftsman constitutes possession of the craft.

Intrinsic capacities (of which craft capacities are just one example) are to be contrasted with relational capacities, which might be accounted capacities in only an etiolated sense. I enter a race during the morning, at which time there is another runner entered who is far faster than me. At that time I do not possess the 'capacity' to win the race. At lunch time the faster runner drops out, leaving me the fastest entrant, and then I do possess the 'capacity' to win. I possess this capacity in virtue of a relation between myself and the other competitors. So acquiring the capacity need not constitute a genuine change in me, and no explanation is required of my acquiring the capacity which appeals to non-relational facts about me.

Aristotle's claim is that a Megarian cannot accommodate (*a*) and (*b*). Suppose Candy heals during the morning, refrains from healing during the afternoon, and then heals again during the evening. [M] entails that Candy possesses a capacity vis-à-vis healing only during the morning and evening: but there is no capacity which Candy learns between afternoon and evening, nor that she loses due

to memory loss or injury between morning and afternoon. Since Candy's inactivity during the afternoon might be due to purely relational facts about her (for instance, that no patients came to her surgery), a Megarian will be unable to say why the acquisition and loss of craft capacities calls for a particular sort of explanation, and will be hard-pressed to maintain the generally accepted distinction between craft capacities and relational capacities.

5. 1047^{a}4–7: Protagorean Relativism

The previous argument focused on a paradigm example of two-way (rational) capacities—namely, craft capacities. Aristotle now alleges that a Megarian will have problems with those one-way (non-rational) capacities which can affect perception.

Aristotle's charge is that in the case of perceptually accessible properties a Megarian is committed to a view stated and criticized by Plato in the *Theateteus* (151e–152c for a statement, 170a–172c, 177c–179b for substantial criticism: Aristotle's examples *hot*, *cold*, and *sweet* at 1047^{a}5 are all to be found in the *Theaetetus*, 152b, 152c, 171e, 178c). The view is the extreme relativist position that things are just and only as they are perceived to be. It will be convenient to follow Aristotle in referring to this view as Protagorean, and to finesse questions about the historical Protagoras (a fifth-century Sophist: for a full treatment see Guthrie 1971).

Protagaoreans will endorse such biconditionals as: something is hot if and only if it is perceived as hot (*Theaetetus* 152 b7). Is a Megarian committed to *both* halves of that biconditional,

(1) A is hot → A is perceived as hot

and

(2) A is perceived as hot → A is hot?

A Megarian might hope for some success in denying (2), and so avoiding full-blown Protagorean relativism. To deny (2) is to hold that things can be misperceived: that sometimes A is perceived as hot, though A is *not* hot. And misperception could be explained in non-modal terms. Someone misperceives A as F if and only if she perceives A as F and yet A is not F. Now a Megarian can endorse the view that nothing is both F and not-F at the same time (the principle of non-contradiction stated non-modally). Suppose then that Candy

perceives the wind as hot and Merle perceives it as non-hot. Since nothing is both hot and non-hot, at least one of Candy and Merle is misperceiving the wind. So it does not follow from someone's perceiving A as F that A *is* F, and (2) is avoided.

However, this is a very limited Megarian success, for two reasons. First, it does not help a Megarian to avoid (1); and, second, admitting (1) entails that the denial of (2) does not secure a non-relativist position worth having.

First (1). This is what Aristotle explicitly alleges against the Megarian position (1047^{a}4–6: 'there will be no cold or hot ... if things are not being perceived'). It is the sufficiently absurd view that, for example, a tomato ceases to be red when the lights go out, or when everyone closes their eyes, and Aristotle might be satisfied with establishing that as a consequence of [M]. In order to force (1) on a Megarian Aristotle needs to appeal to

(3) A is hot → A can be perceived as hot.

The Megarian view of capacities gives

(4) A can be perceived as hot ≡ A is perceived as hot.

But (3) and (4) straightaway entail

(5) A is hot → A is perceived as hot.

Could a Megarian dispute (3), as being an Aristotelian assumption (see *Meteor.* 4.8, 385^{a}2–4)? A Megarian would, of course, prefer to restate (3) as

(3M) A is hot at *t* → A can at *t* be perceived as hot at *t*,

which aligns with [S], the view that all capacities are synchronic. But (3M) entails

(1M) A is hot at *t* → A is at *t* perceived as hot at *t*,

via corresponding changes in (4), and (1M) is absurd enough. If the Megarian goes further, and denies even the revised (3M), he will be hard put to say what makes a property like being-hot-(at-*t*) a *perceptual* property at all, and at that point his position on perceptually accessible properties is in ruins.

Second, (1) plays havoc with any Megarian attempt to escape relativism by denying (2). It follows from (1) that someone who is the *sole* perceiver of A cannot be misperceiving it: her perceiving

A as hot is *mis*perceiving only if A *is* non-hot, but, given (1), if A is non-hot, she would *per impossibile* have to be perceiving A as non-hot too. A further consequence of (1) is that whether or not an individual is misperceiving A is not fixed solely by her perceptions and the state of A. Suppose that Candy and Merle are the only perceivers of A, and are perceiving A differently. Then a Megarian can indeed say that one of them is misperceiving A. However, as each blinks in turn, the other will become the sole perceiver and so will cease to be misperceiving.

6. 1047^{a}7–10: Perception

Megarian embarrassment about perception does not end with the properties which are perceived. It seems plain that perceivers retain the capacity to perceive even when they are not perceiving: otherwise it will be impossible to make out the difference between a sighted man who is not seeing and a blind man (a textual problem at 1047^{a}9 does not affect the direction of the argument).

Aristotle's objection here dovetails exactly with the preceding difficulty at 1047^{a}4–7, and does not require much further comment. Actual perceiving involves both a perceiver and something perceived; so, if there is no actual perceiving occurring, there will not be a perceiver capable of perceiving, nor an object which is perceptible. But actual perceiving may cease either because of changes in the perceiver (she shuts her eyes), or changes in the world (the lights go out). So a Megarian has to say that changes in perceivers affect whether objects are perceptible (the apple has no colour if everyone closes their eyes), and changes in objects affect perceivers (if everything falls silent then no one will be hearing, and so no one will have the capacity to hear).

7. 1047^{a}10–17: Change

Aristotle's final anti-Megarian argument is noteworthy for a number of reasons. First it poses a more serious threat to the Megarians than the first three arguments. No one can force a Megarian to endorse the claims to which the earlier arguments appeal: for example, that craft capacities are intrinsic, or that people do not go blind repeatedly throughout the day. However obvious these may seem to Aristotle or to common sense, a stubborn Megarian could stick to his argument for [M] and deny them. By contrast, Aristotle's final

argument attempts to derive a conclusion from [M] which is at odds with the Megarians' own position. It seems the Megarians are happy to envisage a person who sometimes builds, and sometimes refrains from building, since what [M] says is that *when* someone is building she possesses the capacity to do so, and *when* she is not building she lacks the capacity. However, Aristotle now argues that a Megarian is in fact committed to holding that if someone *ever* φ's then she *always* φ's (1047^{a}14–17).

Second, the argument needs to be interpreted in a way which ensures it does not also threaten *non-Megarians*. It will be clear to many—Aristotle included—that things lack capacities at one time which they later come to possess (children are trained in building; paralysed people are cured and regain the capacity to stand up). So Aristotle needs to be careful in using an argument which purports to move from something's lacking a capacity to build or stand to the conclusion that it never will build or stand. Can the argument be so understood that it poses a threat only to a Megarian position?

Third, the translation of the modal terms in this argument calls for particular comment. As explained at Introduction, §3, the choice between translating occurrences of (*a*)*dunaton* as '(im)possible' or '(in)capable' is fixed by whether the occurrence in question is being treated as a standard or a non-standard modality. So I translate *adunaton* as 'impossible' here because the argument relies on a move from something's being the case to its being *dunaton* (see the comment at the end of this section on Aristotle's reference to the meaning of impossibility at 1047^{a}12–14). However, the translation strategy adopted at Introduction, §3, requires 'capable' for the verb *dunasthai* at 1046^{b}30–31, and 'capacity' for the noun *dunamis* at 1047^{a}11, 18 and 19 (and see §8 below on 'capacity' at 1047^{a}25). Now the Megarians themselves are champions of the actual. They are equally hostile to unexercised capacities and to unactualized possibilities, and the intuition underlying their view ([INT] at §3) is equally alluring concerning capacities as concerning possibilities. Indeed the upshot of Aristotle's first anti-Megarian argument (1046^{b}33–1047^{a}4) is that the meagre modal resources available to a Megarian will not permit them to preserve the distinction between intrinsic craft capacities and etiolated relational possibilities.

Fourth, it might seem that Aristotle's argument here begs the question against the Megarians, and equivocates on the temporal content of the modalities. In fact an excellent route into the argument

of 1049[a]10–17 is to consider this charge of equivocation. We will appreciate the force of Aristotle's argument when we see why the charge is unjustified.

Consider Candy, who is sitting today. Can a Megarian accommodate *change*—for example, her later on standing up? Suppose Candy does change, and tomorrow she does stand up. Then it is true today that she will stand up; and therefore it is possible today that she will stand up tomorrow. (It is this move from 'true today' to 'possible today' which establishes that the modality at issue in the argument is a standard modality.) But, the argument proceeds, a Megarian cannot admit that possibility, and so has to deny the existence of change. The Megarian has to say instead that it is impossible that Candy stand (1047[a]10–11); and, since it is impossible that Candy stand, then Candy will not stand (1047[a]12–14); and so, if Candy is sitting today, she will never stand (1047[a]15–17).

It is at this point that the charge of equivocation looms. What the Megarian claims is that, since Candy is not standing today, then it is not possible today that she stands *today* (notice the temporal references at 1046[b]29–32). But Aristotle interprets that as the claim that it is impossible that Candy stand *simpliciter*—that is, without temporal qualification or tenselessly (1047[a]11–12, 16–17); he then takes that to entail the further claim that it is impossible that Candy *will stand* (1047[a]12–14); and it is that final claim about the future which leads to the conclusion that there is no change. However, the Megarian might object that it is one thing to say that it is not possible today that Candy stands *today*, quite another to say that it is not possible today that Candy will stand *tomorrow*.

Aristotle's argument is a strong one, however, because the Megarian charge of equivocation in fact fails to save their position. Suppose Candy is sitting today, and suppose the Megarian tries to accommodate change—for example, that Candy will stand tomorrow—by claiming that, while it is not possible today that Candy stands *today*, it is possible today that Candy will stand *tomorrow*. Aristotle can now push a question to which the Megarian has no easy answer: is that latter possibility, which obtains today, actualized today or unactualized today? Neither option is going to appeal to the Megarian.

(*a*) If it is actualized today, then it seems that Candy is *today* standing *tomorrow*, and that looks absurd (recall §3 above: it is precisely this sort of reasoning which lies behind the

Megarian's endorsement of [INT] and [S]—the only time at which the possibility of Candy standing tomorrow can be actualized is *tomorrow*).

(*b*) On the other hand, if it is unactualized today, then the Megarian admits a possibility which obtains at a time when it is unactualized (if we were to put it in terms of capacities—a capacity which exists at a time when it is not exercised). But that contradicts the Megarian's view [M], that it is never the case that an unactualized possibility obtains (that nothing ever possesses an unexercised capacity).

So the Megarian cannot hold that it is possible today that Candy will stand tomorrow (recall §2: in short, the Megarian thinks that all possibilities are synchronic). But in that case the equivocation defence gains nothing for the Megarian, since the defence was supposed to make room for its being possible today that Candy stand tomorrow consistently with upholding [M]. And, in that case, the Megarian cannot accommodate the supposition that Candy is sitting today but will stand tomorrow—change is ruled out ($1047^{a}14$).

It is clear now that Aristotle will not be vulnerable to this argument, since he will see no problem with possibilities which obtain at a time without being actualized at that time ($1047^{a}18–19$, 23–4; *Cael.* 1.12, $281^{b}15–18$; the idea that the future is contingent *Int.* 9, $19^{a}7–22$; *EN* 6.2, $1139^{b}5–11$; *Rhet.* 3.17, $1418^{a}2–5$). Indeed, at $1047^{a}24–6$ he will offer a way of establishing whether something non-actual is nevertheless possible.

Aristotle can also allow that, even if it is true at a time that A will in fact ϕ, it does not follow that A has at that time the capacity to ϕ. It is the fact that that inference does not hold which characterizes capacities (non-standard modalities) in contrast to possibilities (standard modalities). As a result, Aristotle can hold that (in some cases) the capacity to ϕ is acquired through acts of ϕ-ing (*Θ*5 $1047^{b}31–5$; *Θ*8, $1049^{b}29–1050^{a}3$; *EN* 2.4, $1105^{a}21–6$). Further, since it does not follow from A's ϕ-ing (either now or in the future) that A has the capacity to ϕ, Aristotle can treat capacities as explanatory origins of change (*Met.* *Δ*12, $1020^{a}1–2$; *Θ*1, $1046^{a}10–11$; *Θ*8, $1049^{b}5–10$). It is the fact that there is a gap between A's ϕ-ing and A having a capacity to ϕ which enables Aristotle to distinguish between moral assessments of actions and of agents (for example, *EN* 2.4, $1105^{b}5–9$; *EN* 5.8—the

distinction depends on the way in which ϕ actions *originate* from the agent).

Finally, how should Aristotle's reference at 1047ª12–14 to the meaning of impossibility be taken? Some commentators (e.g. Hintikka 1973: ch. IX) have seen here significant reference to, or a source of influence on, Diodorus Cronus' definition of the possible as what either is or will be the case (see §3 above). But, according to the present interpretation, Aristotle is referring only to the fact that being possible is entailed by being actual. If it is impossible that A will ϕ, then it must be false to say that A will ϕ, since if it is true that A will ϕ then it is possible that A will ϕ.

8. 1047ª24–6: A Test for Possibility

Aristotle completes his case against the Megarians by summarizing what he has shown (1047ª17–24), and offering a test by means of which modal status can be established (1047ª24–6).

Notice that Aristotle's anti-Megarian summary (1047ª17–18: 'these things cannot be said') is very carefully stated. On the one hand, there is a nice twist in drawing a second-order modal conclusion from the anti-Megarian arguments—it is not just that one *does not* both endorse [M] and deny that change occurs; one *cannot* do both, since the endorsement and denial conflict. On the other hand, Aristotle avoids the family of *dunamis* terms which the Megarian finds contentious, and makes his point with a rare use of the colourless *endechesthai* ('cannot').

Following his summary, Aristotle states a modal test at 1047ª24–6. I have translated so that it provides a way of establishing whether an outcome is *possible*: assume that the outcome obtains, and see whether anything impossible follows from that assumption. In §9 I will consider issues raised by the use of this test. First I comment on the decision to treat it as a test for possibility.

The distinction between *possibility* and *capacity* is a distinction between a standard modality (that something is actual entails that it is possible) and a non-standard modality (that I do something does not entail that I have the capacity to do it). So the primary reason for treating 1047ª24–6 as a test for possibility is that it defines a standard modality: if *p* is in fact the case then clearly nothing impossible follows from *p*'s actually being the case.

However, matters are not entirely straightforward. A version of the *Met. Θ*3 test at *An. Pr.* 1.13, 32ª18–20 adds a further condition:

something can be the case so long as *it is not necessary*, but, if it is assumed actual, nothing impossible results. The non-necessity condition shows that the *Prior Analytics* test characterizes what is contingent (if *p* satisfies the test, so too does not-*p*). But it also means that the modality characterized is non-standard. Suppose *p* is necessary; then *p* will be actual; but it will not satisfy the *Prior Analytics* test, since it will fail the non-necessity condition. If the *Prior Analytics* test characterizes a non-standard modality, perhaps the *Met.* Θ3 test does so too. Further, Aristotle refers back to the Θ3 test in the following chapter (Θ4, $1047^{b}9$–11), and the test is there explicitly applied in order to decide the modal status of what does not actually obtain. Perhaps the Θ3 test concerns the modal status only of what is non-actual, in which case it would characterize a non-standard modality.

There is another point, whose significance is more difficult to assess. A variant of the Θ3 test could be used to assess *deontic* possibilities such as ethical permissibility. Is it permissible for me to ϕ? Assume I actually do ϕ, and then see whether my actually ϕ-ing requires me to do anything impermissible. For example, is it permissible for me to spend the money I find on the table? Assume I do spend the money; but it is Candy's money, and so in that case I have stolen, and it is impermissible to steal; so it is impermissible for me to spend the money I find on the table. Of course such applications require there to be basic and obvious cases of the impermissible; but so too do the more familiar non-deontic applications require there to be obvious impossibilities (that is, contradictions: see §9 below). But deontic modalities are certainly non-standard: the fact that I do ϕ does not imply that it is ethically permissible for me to ϕ. So it is not true that something like the Θ3 test could be used only to characterize standard modalities.

Nevertheless it remains reasonable to take $1047^{a}24$–6 as a test for possibility. Four points are relevant:

(i) There is distinction between the modal notion the test characterizes, and the cases to which Aristotle predominantly applies it. If something is actual its modal status is manifest: if *p is* true, it is plain that it is possible, and there is no need to *assume* that it is true. Indeed, it is *because* the test defines a standard modality that the modal status of a true *p* is manifest. In contrast, when *p* is false, its modal status is not manifest, and then assumption of its truth is

called for. So it is to be expected that Aristotle will apply the test predominantly to false claims, whose modal status is not manifest; and then it should be unsurprising that he will sometimes state the test in a form limited to the non-actual, where modal status is non-manifest.

(ii) The test fits most clearly into the strategy of the chapter if taken as a test for a standard modality (possibility). Aristotle takes issue with Megarian views on the modal status of the non-actual, rather than the actual (he lets their claim at $1046^{b}31-2$, that 'someone who is building is capable when he is building', pass). It would be perverse for Aristotle to express an anti-Megarian position by means of a test which did not characterize a standard modality and license the move from actuality to possibility.

(iii) Capacities are non-standard modalities; but it would be perilous to take $1047^{a}24-6$ as a test for capacity possession. Aristotle should not agree that A possesses the capacity to ϕ so long as nothing impossible follows from supposing that A does ϕ: A's ϕ-ing might be due to luck, or performed in the course of A's acquiring the capacity to ϕ, and not be evidence of A's possession of any capacity to ϕ.

(iv) A consequence of the translation strategy adopted at Introduction, §3, is that the noun *dunamis* at $1047^{a}25$ is translated 'capacity'. That sits oddly with the references to 'possibility' in the surrounding text, but should not be too misleading. The noun is used at $1047^{a}25$ to refer to what it is that is assumed to be actual in the application of the test. There is no other noun available to refer, for example, to what I assume actual, when applying the test to establish whether it is possible that the building apprentice (who strictly lacks the capacity to build) should erect a wall.

9. $1047^{a}24-9$: Application of Aristotle's Test

According to this test, establishing the modal status of *p* usually involves two stages. First, assume that *p* is actually the case; second, consider whether anything impossible follows from *p*'s being actually the case. (If *p* actually *is* the case, the first stage is superfluous, and the verdict on the second stage is manifest.) If something impossible does follow, then *p* is not possible.

The test assesses the modal status of *p* by deriving consequences from *p* and assessing *their* modal status. For this to be a sensible way of proceeding, there must be some consequence of *p* whose

impossibility is more obvious than the putative impossibility of *p* itself. So it is reasonable to expect that the impossibilities we are looking for should be explicit contradictions. Aristotle's use of the test bears this out. At *Met.* Θ4, 1047^{b}9–12, the test is used to establish that it is impossible that there should be a common measure of the diagonal and the side of a square: assuming that there is a common measure has the consequence that the same number is both odd and even (*An. Pr.* 1.23, 41^{a}26–7). At *Cael.* 1.12, 281^{b}21–3, the test is applied to what will in fact exist for ever, in an attempt to show that it is impossible that it should ever fail to exist: the consequence alleged to follow from assuming its non-existence is that it exists and does not exist at the same time.

The test can be used to characterize different types of possibility. The best way to appreciate that point is through considering the *Additional Adjustments* problem. Suppose *p* is in fact false, and I want to establish its modal status. Aristotle's test tells me to assume *p* true, and see whether any impossibilities result. When checking for impossibilities, what additional adjustments should I make to how things in fact are, along with my assumption of *p*? There are two extreme answers. The *extremely isolationist* answer is that the truth of *p* should be assumed in complete isolation from anything else. The *extremely accommodating* answer is that all those adjustments should be made which are required to accommodate the assumption of *p*.

The extremely isolationist answer is unacceptable, since it leads to a Megarian-style refusal to admit non-actual possibilities. Suppose I am in fact sitting; and it is also the case, for example, that my legs are bent, that you see me sitting, and that no one in the room is standing. Is it possible that I should be standing? If the assumption that I stand is made in complete isolation, then contradiction will follow: it will be the case both that my legs are straight (given the assumption that I stand) and that my legs are bent; or that I am standing and that you see me sitting; or that I am standing and that no one in the room is standing. But in that case Aristotle's test delivers the unacceptable verdict that when I am sitting, it is impossible that I should be standing (*Met.* Θ4, 1047^{b}13–14; *Cael.* 1.12, 281^{b}8–10).

The extremely accommodating answer does not have that unacceptable consequence. There are two points of interest to note about it.

First, if Aristotle's test is applied in the extremely accommodating manner, then it will assess *p* as possible if and only if *p* is self-consistent. Suppose some false *p* is to be assumed true in order to test its modal status. There are two cases to consider.

(i) Inconsistent claims, which themselves entail a contradiction: for example, that I am flourishing on a diet of poison, or that the side of a square is commensurable with the diagonal. If *p* is inconsistent, contradiction will result whatever further adjustments are made with the aim of accommodating *p*, since contradiction derives from *p* itself. So inconsistent claims will fail the test, and be accounted impossible.

(ii) Claims which are self-consistent, either because they are logically simple (for example, that I stand) or logically complex but consistent (for example, that I stand and sing). When *p* is consistent, and yet a contradiction *q*-and-not-*q* results from assuming *p*, that can only be because *p* entails *q*, and yet not-*q* is in fact true (or *p* entails not-*q*, and yet *q* is in fact true). But in that case the extreme accommodating strategy recommends adjusting the fact that not-*q* (or the fact that *q*) in order to accommodate the assumption that *p*. So contradiction will no longer result; every self-consistent *p* will pass Aristotle's test and be accounted possible.

Second, suppose *p* is assumed true, no impossibility results, and it is thereby established that *p* is possible. As I make all the adjustments required in order to accommodate the assumption of *p*, I embed *p* in a consistent set of other propositions: I move away from a specification of how things are (from the actual world) towards a consistent specification of a set up constructed in order to accommodate *p* and its consequences. And that leads naturally to an account of possibility according to which *p* is possible if and only if there is a consistent set up (a possible world) in which *p*.

In accounting all and only self-consistent claims as possible, the extremely accommodating treatment of Aristotle's test characterizes a single type of possibility: broadly logical possibility. And it is certainly clear that broadly logical *im*possibilities (inconsistent claims) should fail the test. At *Θ*4, 1047^{b}6–12, the test is applied to a geometrical impossibility, that there should be a common measure of the side and diagonal of a square (perhaps it is applied to that case because Aristotle's target in *Θ*4 is someone who reduces all

putative impossibilities to mere perpetual falsehoods, and broadly logical impossibilities would be a particularly difficult case for them to swallow: see Commentary, Chapter 4, §2). What is less clear is whether the test should be applied in such a way that these are the only impossibilities it delivers.

There is a difficult comment at *Θ*5, 1048^{a}15–16, which is best understood as a reference to what is rendered impossible by contingent hindrances (for discussion see Commentary, Chapter 5, §10). It seems Aristotle has in mind this sort of example: even if Candy is a trained builder, still if there are no bricks around, or if the bricks are in an unsuitable condition for construction, then it is not possible that Candy build. Or consider instead the temporal modalities. At *Int.* 9, 19^{a}23–7, Aristotle mentions what is necessary relative to the time at which it is actually the case: if it is raining now, then it is necessary now that it is raining now (see also *Rhet.* 3.17, 1418^{a}2–5). And, while his attitude to the modal status of the present is not always so clear (*Cael.* 1.12, 281^{b}9–10, 283^{b}13–14; *Met. Θ*4, 1047^{b}13–14), he is firm in his view that the past is fixed (*EN* 6.2, 1139^{b}5–11): so, while it was at one time an open matter whether I studied Aristotle, it is now impossible that I never did so.

What is characteristic of such cases is that whether *p* is possible or impossible depends on further facts which are not included in the content of *p*. Some of these will be facts about the agent to whom the possibility attaches: at one time it was possible that Candy should die a spinster, but *now* (since Candy got married last year) that is impossible. Others will be contingent facts about the world: since the wood happens to be missing and the bricks are not properly baked, it is not possible that Candy build a house.

Cases like this are to be captured by applying Aristotle's test in a *partially accommodating* manner. When testing a false *p* for possibility, *some* facts should be held fixed, and not adjusted in order to accommodate the assumption that *p*. But *some* facts should not be held fixed and should be adjusted to accommodate the assumption that *p*: if not, the unacceptable Megarian consequence of the extremely isolationist treatment will follow. *Which* facts should be held fixed, and *which* adjusted, depends on which type of possibility is being tested for. For example, suppose I am characterizing temporal possibility and impossibility, relative to a fixed past. Candy is not now a spinster: is it nevertheless possible that she now be a

spinster? Assume that she is a spinster; hold fixed facts about the past (in order to capture the temporal modality we are interested in); adjust other facts so as to accommodate the assumption that Candy is now a spinster (for example, assume also that Candy could marry tomorrow); see whether an impossibility results. In this case it does: we are holding fixed the fact that Candy was married in the past, whereas assuming she is now a spinster entails that she was not married in the past. Adjustments which do not involve adjusting the past can be made in order to accommodate the assumption that she is now a spinster: for example, if we are to assume she is a spinster, we also have to assume she is legally free to marry, and we can make that assumption without adjusting the past, since she could be legally free to marry whether or not she was married in the past. But, if the test is to deliver the verdict that it is temporally possible that Candy be a spinster now, then we have to be able to make *all* the adjustments required to avoid contradiction; and in this case that is not so, since we are holding the past fixed.

The *Θ*3 test does not in itself characterize one type of possibility rather than another. It does not dictate *how* accommodating one should be in applying it—which, if any, range of facts should be held fixed when assuming *p* and checking for contradiction. In fact, Aristotle does not in *Met. Θ* take much interest in temporal modalities. He is, however, concerned with possibility and impossibility relative to actual contingent conditions (*Θ*5, 1048^{a}15–16, again): the sense in which the absence or unsuitability of prerequisites for Candy's building renders it impossible that Candy build. The important conclusion to be established in *Θ*5 is that capacities necessarily issue in changes in the right conditions—that is, unless something about agent or patient *prevents* it (see Commentary, Chapter 5, §11): necessarily the fire will burn the wood, unless, for example, the wood is wet, or the flames are damped down. *Prevention* is a modal notion: so too are the notions of *normal*, *interfering*, and *blocking* conditions which were required to explain the difference between one-way and two-way capacities (see Commentary, Chapter 2, §4). And whether or not conditions obtain which are right for a capacity to be exercised, or which prevent or interfere with the exercise of the capacity, may well be an entirely contingent matter. So it is important that Aristotle's test for possibility could capture im/possibility relative to actual contingent conditions (see later on *Θ*5, 1048^{a}16–21, for

detailed comments on Aristotle's treatment of possibility and the capacity–change relation).

Just *how* accommodating should one be in applying the *Θ*3 test, in order to capture this sort of (im)possibility relative to actual contingent conditions? When testing for this type of possibility one should not adjust facts which are *causal antecedents* of the possibility at issue, facts which it would be appropriate to cite in explanation of the possibility or impossibility. For example, in assuming that Candy, who is in fact resting, erects a wall, I should not also assume that bricks which are in fact missing are present. For the presence of bricks is causally relevant to the possibility of her erecting a wall: it would be appropriate to say that it is not possible that Candy build a wall *because* there are no bricks around. On the other hand, I should adjust such facts as that no one erects a wall, and that you see Candy resting. Such facts are not causal antecedents of the possibility in question: it would be inappropriate to say that it is not possible that Candy build a wall *because* no one is building a wall (or *because* you see her resting).

10. $1047^{a}30$–$1047^{b}2$: Actuality and Change

This passage is rather disconnected from the rest of the chapter, and interrupts the transition between *Θ*3 and *Θ*4 (*Θ*4, $1047^{b}3$, is a back reference to the body of *Θ*3). It may have been placed here as an explication of *being actual*, parallel to the account of possibility provided at $1047^{a}24$–9 (as Aquinas suggests, *Comm. in Met.* §§1804–1806); or because someone (mistakenly) identified the denial that non-beings change as a Megarian position (compare $1047^{a}14$ with $1047^{a}32$–3). The aim is to reinforce a point already made in the opening chapter (*Θ*1, $1046^{a}1$–2), that 'actuality' is primarily used in connection with change, and is then extended to cover also the additional and more opaque applications which are the subject of Chapters 6–9.

The broad outline of the passage is clear enough. It divides into three:

[A] Aristotle's claim: *actuality* is applied primarily to change ($1047^{a}30$–2).
[B] A view which confirms [A]: non-beings do not change, though they can, for example, be thought about or desired ($1047^{a}33$–5).
[C] An argument in defence of [B] ($1047^{a}35$–$1047^{b}2$).

To whom should [B] be attributed? Aristotle does not say (1047^{a}33: '*people* do not assign change'). It is unlikely that [B] is a specifically Megarian view; if it were, the overall strategy of the passage would be very opaque. It is better to take [B] as a widely held position: its precise adherents are unimportant, since it is the breadth of its appeal which fits it to confirm [A]. Aristotle himself need not endorse everything which [B] could be brought to encompass. But he appeals to [B] as confirmation of [A], and provides an argument [C] in support of the essential point of [B]; so we should take Aristotle as himself agreeing with the main intuition behind [B].

[C] rests on Aristotle's own analysis of change (see *Phys.* 3.1–2: compare also *Phys.* 5.1, 225^{a}20–9: there is no change of what-is-not, and coming-into-being is not a change). Two of the six occurrences of *entelecheia* (fulfilment) in *Met. Θ* are in the present passage. *Phys.* 3.1 predominantly uses the term *entelecheia*, which may account for its use at 1047^{b}2. (On the use of *entelecheia* to indicate the wider application of *energeia* (actuality) beyond the case of change, compare 1047^{a}30 with *Θ*8, 1050^{a}22–3; for further discussion of the term *entelecheia*, and its relation to *energeia*, see Introduction, §4.) If [B] is to support the specific connection which [A] alleges between actuality and *change*, then [C] has to establish that it would be particularly inappropriate to attribute change to non-beings. According to the Aristotelian analysis of change, for something to change in respect of a property F there must be an enduring subject which is first of all potentially F and then actually F. A non-being cannot undergo change, since a non-being can never be *actually* F (this is Aristotle's point in the dense 1047^{a}35–1047^{b}1: a non-being will undergo change only if, being first of all not actually F it will then be actually F).

The remark at 1047^{b}1 ('some of the things which are not are potentially') is initially puzzling. Since [B] is commonly endorsed, what adherents of [B] will count as an example of a non-being is unspecified. Various proponents might take [B] to cover various cases: examples of non-beings which do not change could, to one person or another, cover fictional characters (Sherlock Holmes cannot get older), mythical creatures (unicorns cannot lose their horns), the dead (my great-grandfather cannot get hungry—compare Aristotle's own intuitions concerning the dead at *EN* 1.10), existent things before they existed (my house can now crumble, but it could

not do so before it was built; on past and future existents, see *Phys.* 4.12, 221^{b}31–222^{a}1). Some of these cases will be acceptable to Aristotle, and some not; and in some cases he is willing to identify something which will turn into an actual F as potentially F (the issue is considered in detail at *Θ*7, 1048^{b}37–1049^{a}18). The qualification 'some of the things which are not' adverts to those examples which are respectable in Aristotle's eyes. The point of the qualification is that we should not object to a non-being changing on the grounds that a non-being cannot be potentially F (a point about the terminus *a quo* of a change): what is important is that a non-being cannot be actually F (a point about the terminus *ad quem*). It is because a change terminates in something's being *actually* F that attributing change to non-beings is particularly inappropriate. Someone might make out a sense in which being-a-detective can be attributed to Sherlock Holmes, and horns can be attributed to unicorns (1047^{a}33–4 leaves it open what other attributions to non-beings, besides being-thought-of and being-desired, are admissible): but in these cases there is no pressure to say that Holmes is an *actual* detective, or that unicorns *actually* have horns.

CHAPTER 4

1. An overview of the chapter

This chapter consists of two sections.

The purpose of the first section ($1047^b3–14$) is a matter of dispute. It admits of a variety of interpretations, none of which is without its difficulties. According to the most appealing interpretation, it addresses an anti-Aristotelian position, which admits a distinction between the possible and the actual (perhaps under pressure from Aristotle's arguments in the preceding chapter), but then identifies the (merely) possible and the non-actual. This position therefore restricts the number of modal categories to two: the actual and the merely possible. It rejects the Aristotelian view, according to which certain things are impossible. Putative impossibilities are taken instead to be (merely) perpetual falsehoods ($1047^b6–9$). Aristotle disputes this position ($1047^b3–6$); his criticism, however, is in effect simply a restatement, and application, of the test for possibility stated in *Θ*3 ($1047^b9–14$).

In the second section ($1047^b14–30$) Aristotle states, and argues for, two related modal theses: first (stated $1047^b14–16$, argued for $1047^b16–26$) that from 'if A is the case then B is the case' there follows 'if A is possible then B is possible'; and second (stated $1047^b26–7$, argued for $1046^b27–30$) its converse, that from 'if A is possible then B is possible' there follows 'if A is the case then B is the case'. The first principle looks more appealing than the second. Aristotle's argument for the first principle is rather repetitive. His argument for the second is extremely condensed.

This material gathered as Chapter 4 may seem to lack unity of structure. But there are three good reasons for this pair of sections to be connected into a single chapter, and for that chapter to follow immediately after *Θ*3:

(i) The position Aristotle criticizes in the first section of *Θ*4 would be tempting to someone who wanted to maintain an anti-Aristotelian position, in the face of Aristotle's *Θ*3 arguments. *Θ*3 establishes a distinction between the possible and the actual; those criticized in *Θ*4 admit that distinction, but deny that anything non-actual is *im*possible. It would

be sensible, in response to that view, to supplement the Θ3 arguments with the first section of Θ4.

(ii) Aristotle appeals in both sections of Θ4 to the test for possibility which was stated in Θ3 (stated at Θ3, 1047[a]24–6; appealed to in Θ4 at 1047[b]3, 1047[b]9–11, 1047[b]18–19). So it is appropriate that both sections of Θ4 should occur together in close proximity to Θ3.

(iii) Commentators disagree on how to take the first modal principle stated at 1047[b]14–16. But according to one treatment it is closely related to the test for possibility given in Θ3 (1047[a]24–6), being equivalent to the claim that, if B is entailed by A, and B is impossible, then A is impossible. That claim underpins Θ3's test. For, according to that test, I establish the impossibility of A by showing that A entails something impossible, while, if A entails nothing impossible, then A is possible. In that case, since the first section of Θ4 relies on appeal to the Θ3 test for possibility, it would be natural for that section to be followed by discussion of a modal principle which underpins that test.

2. 1047[b]3–14: Three Interpretations of Aristotle's Argument

It is difficult to be confident of an interpretation of the first section of Θ4. It is sensible to start from the following uncontentious points about the passage. Aristotle introduces two claims:

(1) This is possible but it will not be (1047[b]4–5).
(2) Things which are impossible get away (1047[b]5–6).

Aristotle considers a proponent of (2) who claims that it is *possible* that the diagonal and side of a square be measured by a common unit while allowing that in fact they *never will be* so measured (1047[b]6–9). He argues against (2) by appealing to

(3) nothing impossible follows from assuming the possible to be actual (1047[b]10–11)

in order to establish that measurement of the diagonal is impossible. In appealing to (3) he applies the test for possibility stated in Θ3. That is why Θ4 opens at 1047[b]3 with a back reference to the preceding chapter.

Beyond these uncontentious points, however, very little is clear. An immediate question is what the rejection of (2) has to do with (1). I have translated the connective Aristotle uses at $1047^{b}5$ as 'the consequence being that'. That translation is intended to preserve a latitude which the Greek allows between different claims Aristotle might be making about the relation between (1) and (2). Here follow three alternative interpretations of the structure of the argument.

[A] What Aristotle says at $1047^{b}3$–6 is that it cannot be true to assert (1) that something is possible but will never be the case. He then gives the reason: *since the consequence of saying that* would be (2) that nothing will count as impossible.

Further, (2) is to be rejected on the basis of (3): the test for possibility given in *Θ*3 enables us to discriminate between what is possible and what is impossible (between what passes and what fails the *Θ*3 test). Since (2) is to be rejected, and since the consequence of saying (1) would be (2), then it cannot be true to say (1).

In denying (1) Aristotle denies that something can be possible without being at some time actual. That is equivalent to claiming that if something is possible then it is sometime actual—a view generally known as the Principle of Plenitude. According to this interpretation, then, Aristotle asserts a strong connection between modal and temporal concepts (Hintikka 1973: ch.5, especially §11).

There are at least two objections to interpretation [A]. First, it appears from elsewhere that Aristotle allows that some instances of (1) are true (*Int.* 9, $19^{a}12$–14: it is possible that this cloak will be cut up, but it will not be cut up). Such passages would be consistent with Aristotle's commitment to a more limited form of the Principle of Plenitude: for example, that, if something is *eternally* possible, then it is sometime actual. But they will remain inconsistent with an indiscriminate rejection of (1). Second, charity tells against interpretation [A], since there are no grounds which should appeal to Aristotle for the claim that asserting (1) would have the consequence that (2).

[B] The second interpretation avoids both these objections. What Aristotle is saying at $1047^{b}3$–6 is that it cannot be true to assert the following conditional: (1) that something is possible but will never be the case, *has the consequence that* (2) nothing will be impossible.

It is Aristotle's *opponent*, rather than Aristotle himself, who claims that (1) has the consequence that (2). Aristotle rejects the inference from (1) to (2) by showing that (2) is false, on the basis of (3). According to this interpretation, Aristotle does not himself endorse the Principle of Plenitude. On the contrary, his argument relies on there being true instances of (1) (*Int.* 9, $19^{a}12–14$). For, since there are true instances of (1), and since (2) is false, then it cannot be true to say that (1) has the consequence that (2).

Since it is Aristotle's opponent who claims that (1) entails (2), the justification for deriving (2) from (1) need not align with Aristotle's own views on modality. And there is a reasonably plausible account of modality ascription according to which (1) would entail (2). It starts from the intuition that it is easier to ascertain the truth value of a (non-modal) sentence than its modal status, and concludes that (non-modal) truth values should be the touchstone for deciding modal status. According to this account, I am justified in saying that *p* is possible only if I can establish that *p* either is or will be true; and the only acceptable grounds for saying that *p* is impossible would be establishing *p*'s perpetual falsity. Proponents of this account reject Aristotle's modal test (3), and replace it by a non-Aristotelian test for possibility. Given their view of modality ascription, the truth of any instance of (1) *would* entail (2). If there is no reliable indicator of impossibility other than perpetual falsity, then admitting (1) that even one possibility is perpetually false would entail (2) that nothing can be identified as impossible—and it would be a nice statement of that consequence to say that impossibility 'gets away' ($1047^{b}5–6$).

Of course a proponent of this account of modality ascription would not himself assert (1). He might, however, hope to make trouble from the fact that *Aristotle* allows some true instances of (1) by claiming that *Aristotle* is committed to (2). He would be an anti-Aristotelian prosecuting his case by deriving an absurd conclusion (2) from an Aristotelian admission (1) about possibility. His case would rely on the non-Aristotelian account of modality ascription mentioned above. Aristotle's response would be to reject the non-Aristotelian account of modality ascription, and thereby undercut the claim that (1) entails (2). In that case it would unsurprising that Aristotle should preface his denial that (1) entails (2) with a back reference to his own test for possibility (*Θ*3, $1047^{b}3$), state that test as (3), and then go through an application of the test in a concrete case in order to rebut his opponent's position ($1047^{b}6–14$).

However, there are difficulties in squaring interpretation [B] with Aristotle's text. First, $1047^{b}4$–6 suggests that Aristotle objects to *asserting* (1)—although leaving it open whether he wants to rule out *all* assertions of (1), as interpretation [A] would propose, or *only* assertions of (1) made with the intention of establishing a non-Aristotelian conclusion about modality, as [C] would hold. On interpretation [B], however, Aristotle should have no objection to asserting (1): on the contrary, since his opponents do not themselves assert (1), and since his argument relies on his admitting some true instances of (1), he should recommend asserting some instances of the form (1). Second, the argument which this interpretation attributes to Aristotle requires appeal to something from outside the present text: namely, Aristotle's willingness to admit some true instances of (1). Neither of these objections is decisive: the text could just about be read as [B] requires, and there could be other Aristotelian views about modality in the background. But they do mean that [B] fits less naturally with $1047^{b}4$–6.

A third problem is fitting [B] with the diagonal example at $1047^{b}6$–9. Aristotle is there arguing against someone who asserts an instance of (1): that measurement of the diagonal (that is, by a unit which also measures the side of the square) is possible, although it will never in fact occur. But, according to interpretation [B], that is not something which Aristotle's opponent would assert, since it would be inconsistent with his Aristotelian account of modality ascription. Further, it is unclear why establishing a geometrical impossibility by appeal to (3) would serve Aristotle's purpose, which according to [B] is to show that (1) does not entail (2).

Again [B] can accommodate the passage though with a somewhat forced reading of the text. According to interpretation [B], Aristotle's target is the opponent who rejects (3), Aristotle's own test for modality ascription. That person, in Aristotle's eyes, does not take impossibility properly into account ($1047^{b}7$–8), but claims instead that, if any true instance of (1) were admitted, then no impossibilities could be established. So Aristotle focuses on an example: the opponent will claim that, if (1) were ever true, then no one could show that it is impossible—rather than merely perpetually false—that the diagonal will be measured. The diagonal example is provided as an illustration of what Aristotle's *opponent* alleges would be the cost of admitting any true instance of (1): namely, that nothing would count as impossible. It is some support for this reading that $1047^{b}8$–9

describes someone who asserts that the diagonal can be measured *because* (1) is true. For Aristotle's opponent claims that (1) entails (2), and so anyone who allows that (1) is true must therefore allow (for example) that the diagonal can be measured.

Given that reading of the diagonal example, Aristotle's response is entirely appropriate. Aristotle does not endorse his opponent's account of modality ascription. He reiterates his own test (1047^b3, 9–11). He then shows that, according to *that* test, measurement of the diagonal *is* impossible (1047^b11–12). But Aristotle's test leaves it entirely open that an instance of (1) should be true (and in fact Aristotle thinks that some instances of (1) are true). So Aristotle is able to establish by means of his test (3), and consistently with (1) being true, that measurement of the diagonal *is* impossible; and therefore Aristotle shows that (1) does not entail (2).

[C] This interpretation claims many of [B]'s advantages over [A]. Unlike [A], it avoids supposing either that Aristotle himself holds that no instances of (1) are true, or that Aristotle believes that (1) would entail (2). But, unlike [B], it fits more easily with the text.

According to [C], Aristotle's opponent does assert (1) quite generally, as a deflationary account of impossibility according to which all putative impossibilities are really just perpetual falsehoods. What Aristotle is saying at 1047^b3–6 is that you cannot assert (1) that something is possible but will never be the case *and draw from that the consequence that* (2) nothing is really impossible. Aristotle's opponent, according to this interpretation, is a counter to the Megarian opponent of *Θ*3. While the Megarian admits too few possibilities, this opponent admits too many: hence the parallel between *Θ*3, 1047^a18–19 (possibility and actuality are different), and *Θ*4, 1047^b12–13 (falsity and impossibility are not the same). Aristotle's response to this opponent is to show that, according to (3), the *Θ*3 test for possibility, some things are genuinely impossible—for example, the measurement of the diagonal (1047^b6–12). Aristotle thereby challenges a particular instance of his opponent's deflationary strategy: the replacement of putative impossibilities by mere perpetual falsehoods—that is, the assertion of (1) in order to establish (2). (For interpretation [C] see Kung 1978; McClelland 1981, and Owen in Burnyeat 1984: 102.)

Interpretations [B] and [C] are similar in so far as both take Aristotle to be objecting, not to the assertion of (1) as such, but to the move from (1) to (2). But [B] and [C] differ in two important respects:

(i) According to [B] Aristotle's opponent alleges that, if someone admits even *one* instance of (1), a perpetually false possibility, he will be committed to (2) the collapse of all genuine impossibility. The opponent alleges, for example, that, if Aristotle says that this cloak can be, but never will be, cut up, then *Aristotle* is committed to allowing that the diagonal can be measured. The dialectic according to [C] is different. The [C] opponent does not think he scores an anti-Aristotelian point as soon as Aristotle admits a single instance of (1), that this cloak can be, but never will be, cut up. The [C] opponent hopes to win his case instead by concentrating on Aristotelian assertions of *impossibility* and persuading Aristotle to replace them with assertions of mere perpetual falsehood.

(ii) [B] and [C] diverge on the diagonal example ($1047^b6–9$). The [B] opponent *does* think that measurement of the diagonal is impossible, precisely *because* it will never occur. What the [B]-opponent claims is that anyone else (such as Aristotle) who admits even one perpetually false possibility would *not* be entitled to hold it impossible that the diagonal be measured. In contrast, the [C]-opponent does *not* hold that measurement of the diagonal is impossible, but admits only that it will never occur.

While interpretation [C] is probably preferable, all things considered, it has its problems. First, [C] lacks a plausible account of what entitles the anti-Aristotelian to treat all putative impossibilities as perpetually false possibilities. The [B]-opponent's view of modality ascription, which justified his claim that (1) entails (2), is not available. For that view had the consequence that what is perpetually false is thereby shown to be *im*possible, while Aristotle's opponent, according to [C], holds that what is perpetually false is nevertheless *possible*. No other very appealing justification for the [C]-opponent's position is forthcoming (Burnyeat (1984: 102, 105) suggests an appeal to the assumption that whatever can be significantly stated is possible, from which it would follow that, in saying something is impossible, I thereby show that it is possible—but that

is not a very attractive justification). Perhaps the [C]-opponent's view does not need a principled defence, however, since it may simply be laying claim to some logical space left open by Aristotle's anti-Megarian arguments in *Θ*3. Those arguments established only a distinction between the actual and the merely possible. Insisting that everything non-actual is possible (that nothing is impossible) would be a way of accommodating the *Θ*3 arguments, while maintaining an anti-Aristotelian position.

Second, Aristotle's response to his opponent on interpretation [C] is rather weak. Establishing of a particular case (the measurement of the diagonal) that it is impossible is, of course, a good strategy to adopt against someone who denies that there are any impossibilities. But his opponent is unlikely to be moved when it turns out that the impossibility of that case is established only by deriving a further impossibility. The [C]-opponent will presumably deny Aristotle's bare assertion (1047^b12) that being measured is impossible; and, if the claim is expanded (as at *An. Pr.* 1.23, $41^a26–7$) the opponent will no doubt deny that it is *impossible* that an odd number be equal to an even number—though admitting, of course, that no odd number ever *is* or *will be* equal to an even number. It may be unreasonable, though, to expect Aristotle to do any more in response than to draw out the consequences of an opponent's consistently sticking to his deflationary position.

3. $1047^b14–30$: Two Modal Principles

In the second half of *Θ*4 Aristotle states and argues for two modal principles. The first is given at $1047^b14–16$ and defended at $1047^b16–26$. The second is stated at $1047^b26–7$ with supporting argument at $1047^b27–30$. There is a question about whether his claims can be understood charitably. The principles seem to be:

(1) If (if A then B) then (if A is possible then B is possible).
(2) If (if A is possible then B is possible) then (if A then B).

Note the occurrence of 'necessary' in the statements of the component conditionals of [1] and [2] ($1047^b14–16$ 'when A is the case it is *necessary* that B is the case' and 'if A is possible it is *necessary* that B is possible'; also $1047^b26–8$). This suggests that the component conditionals are to be read strongly, and not merely as truth-functional or material conditionals. Note also that [1] and

[2] appear to be one another's converse, so that the antecedent of [1] is the consequent of [2], and the antecedent of [2] is the consequent of [1].

At first sight [2] looks implausible. Commentators often refer to possibilities for incompatible outcomes in order to falsify [2] (for example, Burnyeat 1984: 110–11). Maybe the possibility that Labour win the next election implies that it is possible that the Conservatives win; but plainly Labour's winning the next election does not imply that the Conservatives win. But it is not necessary to refer to incompatibles. Consider instead this case. If it is possible that this fair coin is tossed, then it is possible that this fair coin shows heads; but it does not follow that, if the fair coin *is* tossed, then it *does* show heads—although its being tossed and its showing heads are certainly compatible.

Commentators have tried to be charitable about [2] in different ways. The obvious place to start is by looking at what Aristotle has to say in its support. He argues for [2] by explaining what its antecedent means: 'that B is of necessity possible, if A is possible, means this, that if A ever were the case both when and as it was possible, then necessarily that too [that is, B] is at that time and in that way' (1047^b27–30). Aristotle's explanation says something about a relation between times-and-conditions relevant to A (1047^b29: 'both when and as') and times-and-conditions relevant to B (1047^b30: 'at that time and in that way'). But it is hard to be confident about just what these times-and-conditions are. There are two approaches.

According to the first approach they are times and conditions at which A and B *are the case*. This is suggested by the subjunctive at 1047^b29 ('if A ever were the case'; compare 1047^b30: 'necessarily that too [that is, B] is'). What does this come to? We should start with the *Θ*3 test for possibility (1047^a24–6), which is in the background throughout *Θ*4 (1047^b3, 9–11, 18–19). According to that test, I establish whether a false A is possible by assuming that A is the case, making some further adjustments, and assessing the outcome for consistency. The test itself does not dictate what further adjustments should be made in order to accommodate the assumption that A: that depends on and mirrors the type of possibility at issue (recall Commentary, Chapter 3, §9). The upshot is that, in assessing a false A for possibility, I am looking for consistent sets of conditions in which A is the case, and which are required to have more or less in common with how things actually are depending on the type

of possibility at issue. These conditions are not themselves actual, since they are conditions in which it is assumed that A is the case, and often some A will be possible without being actual. They are, in effect, possible worlds, which are more or less similar to the actual world depending on the type of possibility at issue. In talking of times-and-conditions at which A and B *are the case*, Aristotle is referring to such consistent sets of conditions in which A is the case, the consistency of which establishes that A is possible. According to this approach, the antecedent of [2]—'if A is possible then B is possible'—means that any condition (world) in which A is the case is a condition (world) in which B is the case.

According to the second approach, we are concerned with times-and-conditions at which A and B *are possible*. This is suggested by the phrase 'both when and as it was possible' at $1047^{b}29$. What does this idea come to? Start by considering possibilities which obtain at one time, but not at another. For example, before she marries it is possible that Candy should die a spinster; after she marries that is no longer possible. *Part* of what the antecedent of [2]—'if A is possible then B is possible'—says is that any times at which A is possible are also times at which B is possible. But that cannot be all there is to it, and the antecedent of [2] must be saying more than that. For Aristotle is interested in strong conditionals. He begins his explanation of the antecedent of [2] at $1047^{b}27$–8 by saying 'that B is *of necessity* possible, if A is possible, means this . . .'. So he is not thinking about conditionals which are true just because *as it happens* B is possible whenever A is possible. There are conditionals which are true in that way: here is an example of one. Suppose Bartholomew and Candy were born on the same day, are alive now, and are both in their thirties. In that case *as it happens* any time at which it is possible that Bartholomew die in his teens is a time at which it is possible that Candy die in her teens (such as the time they were both 6 years old); so too for the corresponding impossibilities (when they were both 30 years old it was not possible for either of them to die in their teens). But the temporal matching is accidental. It is not the case that *of necessity*, if it is possible that Bartholomew die in his teens, then it is possible that Candy die in her teens. We can see this if—as with the first approach—we again think about non-actual sets of consistent conditions, but on this second approach conditions in which something *is possible*. What Aristotle is telling us at $1047^{b}27$–30 is that its being *of necessity* possible that

B if it is possible that A means that that any condition (world) in which A is *possible* is a condition (world) in which B is *possible*. And that does not hold of our example, for there certainly are consistent sets of conditions in which it is possible that Bartholomew die in his teens, but not possible that Candy die in her teens—for example, those in which Candy is killed when she is 12 years old, while Bartholomew remains hale and hearty.

Suppose we go for the first approach: the times-and-conditions which Aristotle mentions are times-and-conditions at which A and B *are the case*. Then *what* is Aristotle telling us at $1047^{b}27–30$ when he explains the antecedent of [2]? This first approach aligns very naturally with a recent charitable treatment of Aristotle's [2] by Brennan (1994). According to this treatment, what Aristotle is doing in [1] and [2] is providing an *interpretation* of conditionals 'if A then B' (the antecedent of [1] and the consequent of [2]). He *states* that interpretation as 'if A is possible then B is possible' (the consequent of [1] and the antecedent of [2]). And then at $1047^{b}27–30$ he *expands and explains the interpretation* ('that B is of necessity possible, if A is possible, means this. . .'). What we get when we add all that together is the biconditional

[1 + 2] (If A then B) iff any condition (world) in which A is the case is a condition (world) in which B is the case.

We can now understand Aristotle's claims charitably, since [1 + 2] is a perceptive and highly plausible interpretation of strong conditionals in terms of quantification over conditions (worlds). And it is plain why Brennan's treatment of [1] and [2] should align with the first approach to the times-and-conditions mentioned at $1047^{b}27–30$. For, while it would be highly plausible to interpret the conditional 'if A then B' in terms of a relation between times and conditions in which A and B *are the case*, it would be highly implausible to refer to times and conditions in which A and B *are possible*.

Suppose, on the other hand, we go for the second approach: the times-and-conditions which Aristotle mentions are times-and-conditions at which A and B *are possible*. In that case we have a different reading of what Aristotle is doing at $1047^{b}27–30$. He is explaining the meaning of a particular type of conditional, one whose antecedent and conditional are statements of possibility ('if A is possible then B is possible') in terms of a relation between

conditions in which A is possible and conditions in which B is possible. We are presumably intended to look at the antecedent of [2] in the light of that explanation, and by doing so recognize that [2] is true.

However, we are now faced with a difficulty, since it seems that [2] is *not* true. And the explanation Aristotle offers of [2]'s antecedent at $1047^{b}27–30$ does nothing to ease that difficulty. Quite the contrary. That explanation would render the antecedent of [2] true—for it is indeed the case that any condition in which it is possible that the fair coin be tossed is a condition in which it is possible that the fair coin show heads. But the consequent is false: it is not the case that, if the fair coin is tossed, then it *does* show heads. So, if we take the second approach, we would need to say why it should seem that the plausible explanation of [2]'s antecedent at $1047^{b}27–30$, in terms of a relation between times and conditions in which A and B are possible, should *mis*lead someone into thinking that [2] is true.

Here is a suggestion. The following line of argument is flawed, but appealing. The aim is to support [2] by deriving the consequent

[2con] if A then B

from the antecedent

[2ant] if A is possible then B is possible.

According to the second approach, what [2ant] tells me is that any condition (world) in which A is possible is a condition (world) in which B is possible. Suppose I hear that as the claim: any possibility that A is a possibility that B—for example, because when under any condition I consider the possibility of A I also find under that condition the possibility of B. And suppose I slide from that to the further claim: any possibility in which A is a possibility in which B. Now, for the sake of argument assume the antecedent of [2con]: namely, A. Of course this is just an assumption, and A might not in fact be the case. So one might think that in assuming that A I am considering a possibility in which A. But now a dangerous error looms. For [2ant] seemed to assure me that any possibility in which A is a possibility in which B. And then it looks as if, in assuming A, and thereby considering a possibility in which A, I am *ipso facto* considering a possibility in which B, so that I end up assuming B as well. In that case, given [2ant], I start with the assumption that A

and end up with the assumption that B. And then I appear to have derived [2con] from [2ant], and therefore established

[2] if (if A is possible then B is possible) then (if A then B).

The argument is flawed. But the flaws are understandable. It turns on sliding around between talk of A's being possible under certain conditions, talk of the possibility that A, and talk of a possibility in which A. The important ambiguity is in the final notion: *a possibility in which A*. This can be taken as referring either to a possible set of conditions in which A is the case, or to a possibility whose content is A (which possibility is itself, according to [2ant], to be considered as obtaining under certain—possible—conditions).

4. 1046^{b}16–26: The Argument for [1]

Aristotle devotes more space to [1] than to [2]. The discussion at 1047^{b}16–26 is opaque. There are four problems to note:

(i) The subject of 'but that was impossible' at 1047^{b}20 is plainly B, picked up from the preceding sentence. Use of the past tense suggests a back reference to some earlier assumption of the impossibility of B. But there is no sign in what precedes of the assumption that B is impossible.

(ii) (i) is not a narrowly textual point. The best interpretation of Aristotle's argument is that it involves a *reductio ad absurdum* of the assumption that B is impossible; and in that case we would expect an assumption of B's impossibility at the start of the argument.

(iii) The subject of 'let it be impossible' at 1047^{b}20 is also B (again from the preceding 1047^{b}19–20). But it is unclear why B should be assumed impossible at this stage of the argument.

(iv) More generally, the point of continuing the argument beyond 1047^{b}20 is unclear.

There is a suggestion (Burnyeat 1984: 109–10), which would deal with (i) and (ii). 'Then let A be possible' at 1047^{b}17–18 could be a corruption of an original 'then let it be impossible', the subject of which would be B via the preceding 'nothing prevents it not being possible', which in its turn picks up 1047^{b}16: 'it is necessary that B is possible.' Many ancient manuscripts would be written

in Greek capitals and without word breaks, and in that form the readings differ by only two letters: ΕΣΤΩΔΗ{ΤΟ}ΑΔΥΝΑΤΟΝ. I will interpret the passage in accord with this suggestion, although I have not translated an altered text. Burnyeat (1984) suggests in addition that 'then let it be impossible' at $1047^{b}20$ is a misplaced correction to $1047^{b}17$–18, and that suggestion would also deal with (iii) by removing the troublesome phrase from $1047^{b}20$. I do not follow Burnyeat (1984) in this additional conjecture, since I think a reasonable case can be made out for referring at $1047^{b}20$ to the assumption of B's impossibility.

If the treatment of [1] and [2] proposed by Brennan (§3 above) appeals, then Aristotle's aim in $1047^{b}16$–26 will be to support the left-to-right reading of the biconditional

[1 + 2] (if A then B) iff any condition (world) in which A is the case is a condition (world) in which B is the case.

I do not offer here any further detailed comment on the passage understood in line with the Brennan treatment of [1] and [2].

The following exposition takes Aristotle's argument to be supporting [1], understood as the claim that one conditional—[1ant]—whose own antecedent and consequent are a pair of actualities (A, B), entails another conditional—[1con]—whose own antecedent and consequent are the corresponding possibilities (A is possible, B is possible).

The argument falls into two parts ($1047^{b}16$–20, $1047^{b}20$–4, with a closing summary at $1047^{b}24$–6). The first part is fairly straightforward. The aim is to establish [1] by deriving

[1con] if A is possible then B is possible

from

[1ant] if A then B.

Assume [1ant] and assume the antecedent of [1con] that A is possible. If the consequent of [1con], that B is possible, did not follow, then it would be consistent with these assumptions that B should be not possible ($1047^{b}16$–17). So suppose—for the sake of a *reductio*—that B *is* impossible ($1047^{b}17$–18—understood in line with the emendation proposed in Burnyeat 1984). Since it is being assumed that A is possible, nothing impossible would follow

from A's being actual ($1047^b18–19$, an application of the *Θ*3 test for possibility). But, given [1ant], B follows from A, and B is by supposition impossible (1047^b20).

It has, therefore, been shown by 1047^b20 that a contradiction follows from [1ant], A's being possible and B's not being possible: namely, that B is both impossible (by supposition) and possible (since it follows from assuming actual something that is possible). In order to resolve that contradiction, one of the assumptions from which it is derived has to be dropped. If the assumption of B's impossibility is dropped, then [1] is established, since [1con] has been derived from [1ant]. The argument continues past 1047^b20 in order to show that the same conclusion follows if the contradiction is removed by dropping the assumption that A is possible. Suppose the assumption that B is impossible is retained (1047^b20: hence the reference to B's impossibility). In that case, A is impossible (since the assumption that A is possible has been dropped in order to avoid contradiction: $1047^b20–1$ states the conditional, $1047^b21–2$ derives A's impossibility from B's being impossible). But, if B's being impossible implies that A is impossible, then, if A *were* possible, B would be possible ($1047^b22–3$): again, [1] has been established, since [1con] has been derived from [1ant] (made explicit at $1047^b23–4$).

The argument closes with a summary at $1047^b24–6$. The sentence is confusing, since it contains three back references. 'A and B are related in this way' refers to [1ant]; 'if . . . it were not the case that B is possible in this way' refers to the possibility of B following from the assumption of A's possibility at $1047^b22–3$; 'A and B will also not be related as laid down' refers to [1con]. Aristotle's point is that, given [1ant], if the possibility of B did not follow from the possibility of A, then [1con] would not be true.

CHAPTER 5

1. An Overview of the Chapter

After opening comments about the acquisition of capacities ($1047^b31–5$), the chapter's main set of arguments occupy $1047^b35–1048^a24$. Those arguments rely on a result from *Θ*2, that non-rational capacities are one-way capacities, while rational capacities are two way (*Θ*2, $1046^b4–15$; stated as a premiss *Θ*5, $1048^a8–9$). Aristotle also appeals to a premiss concerning the identification of capacities ($1047^b35–1048^a2$). A number of interlocking arguments proceed from these two premisses.

First Aristotle states (1048a5–7):

[A] As regards one-way capacities: necessarily (if agent and patient are in the right condition and related in the right way, then action results).

An argument for [A] can be extracted from the premisses at $1047^b35–1048^a2$ and 1048^a8.

Second, Aristotle argues that the precise parallel to [A] fails for two-way capacities ($1048^a7–8$):

[B] As regards two-way capacities: not necessarily (if agent and patient are in the right condition and related in the right way, then action results).

The argument for [B] is brief ($1048^a8–10$), and is a *reductio* of the positive argument for [A].

Third, an amended version of [A], which does hold for two-way capacities, is stated ($1048^a11–13$; cf. 13–15):

[C] As regards two-way capacities: necessarily (if agent and patient are in the right condition and related in the right way, and the agent chooses to act, then action results).

An argument for [C] is to be constructed by adaptation of the argument for [A].

[C] is followed by a comment about the conditions under which it is possible for an agent to act ($1048^a15–16$). That leads on to $1048^a16–21$, which responds to the objection that [C] and [A] are

false as they stand: an agent could be appropriately related to a suitable patient (and choose to act), but fail to do so because prevented by external circumstances. The crux of Aristotle's response is to refer back to the initial premiss ($1047^b35–1048^a2$) about the content of capacities, and argue that the correct specification of a capacity will incorporate the absence of external preventative conditions.

The chapter ends with a reply to another objection. Aristotle established [B] by deriving an absurdity from [A] ($1048^a8–10$). The salient difference between [C] and [A] is that [C] mentions an agent's desires and choices. But, suppose an agent possessed a two-way capacity and *wanted* to exercise it in both ways. Would [C] entail that she would *per impossibile* act in both ways at once? The argument of $1048^a21–4$ justifies a negative answer to that question.

Conclusions [A] and [C] are of great importance for Aristotle's later account of the relation between actuality and potentiality (see in particular *Θ*8 and Commentary, Chapter 8, §§6–10). In establishing [A] and [C] Aristotle claims that appropriate pairs of active and passive capacities fail to result in an actual change only when something about agent and patient stops them doing so, and renders it impossible for the capacities to be exercised. In the special case in which ϕ is the proper exercise of a correctly specified capacity possessed by A—and only in that case—Aristotle is willing to endorse the conclusion that, if the situation is such that it is possible that A ϕ's, then A ϕ's. That important but circumscribed conclusion is consistent with the position established against the Megarians in *Θ*3, that there is a genuine difference between the possible and the actual.

2. $1047^b31–5$: Capacity Acquisition

It is unclear how the passage $1047^b31–5$ is related to arguments included in the rest of the chapter that do not refer back to it. The passage does expand on the anti-Megarian premiss at *Θ*3, $1046^b36–7$, that it is impossible to possess a craft without having learned it at some time; and it makes a point (1047^b34) about the rational capacities introduced in *Θ*2, and discussed in this chapter.

There is a threefold division of capacities:

(*a*) innate capacities (for example, sight);
(*b*) capacities acquired through habituation (for example, flute playing);

(*c*) capacities acquired through teaching and learning (for example, building).

Acquiring capacities of types (*b*) and (*c*) requires previous practice. That claim might seem both paradoxical and in need of support. In *EN* 2.4 Aristotle responds to the charge of paradox. Since there can be instances of ϕ-ing which are not exercises of the capacity to ϕ, someone *could* play the piano without possessing the capacity to play the piano: for example, playing a tune under instruction, without being able to repeat it at will. So it is not paradoxical to hold that the way to acquire the capacity to play the piano is to do things which would have been exercises of the piano-playing capacity had they been done by someone who possessed the capacity.

However, showing that it *can* be the case that someone ϕ's without possessing the capacity to ϕ establishes only the weaker position, that it would be *coherent* to say that some capacities are acquired through previous exercise. At *Θ*8, 1049^{b}29–1050^{a}3, Aristotle argues for the stronger position that it is *impossible* for someone to possess the capacity to build *without* having previously built (see Commentary, Chapter 8, §5).

At the end of 1047^{b}31–5 Aristotle mentions passive capacities, those 'which involve being affected'—for example, the capacity of clay to be moulded. These were not of concern in *Θ*2, where Aristotle was drawing distinctions among active capacities. However, passive capacities will be important in *Θ*5, because the main claims of the chapter concern the relation between appropriate agent–patient pairs—which is to say, bearers of the appropriate active and passive capacities. But Aristotle's claim in the present passage, that the acquisition of passive capacities does not require previous practice, does not seem universally true—maybe new bronze is not malleable but needs prior beating before acquiring the malleability required by the craftsman.

3. 1047^{b}35–1048^{a}7: The Meaning of [A]

At 1048^{a}5–7 Aristotle gives the first of the three main claims of this chapter:

[A] As regards one-way capacities: necessarily (if agent and patient are in the right condition and related in the right way, then action results).

Before considering whether Aristotle has a good argument for [A] (§§5–7 below), there are two prior questions to raise. First, what is covered by the antecedent of [A]? Second, is [A] a determinist claim? The first question will be dealt with in the remainder of this section, the second in §4.

The antecedent of [A] as I have stated it corresponds to Aristotle's 'whenever agent and patient approach each other so as to be capable' at 1048^{a}6–7. The term 'approach' is intended to cover a range of physical relations (as later in the chapter at 1048^{a}12–13); 'so as to be capable' indicates that the specific relations which are appropriate may well be different for different agent–patient pairs (for example, dye needs to be in physical contact with cloth in order to colour it, while a fire will melt wax so long as it is sufficiently close). Which general types of factor should be included in the antecedent of [A]? Consider an electric ring's capacity to burn paper. We can distinguish these five sorts of factor:

(i) The ring is switched on (an intrinsic feature of the agent, required for the agent to be active).
(ii) The paper is dry (an intrinsic feature of the patient, required for the patient to be affectible).
(iii) The paper is touching the ring (a relation between the agent and patient).
(iv) No strong wind is blowing (the absence of an external hindrance).
(v) There is oxygen in the atmosphere (the presence of an external pre-requisite).

I suggest that the antecedent in [A] covers (i)–(iii): intrinsic properties of the agent (in virtue of which it is active, and properly an agent), intrinsic properties of the patient (in virtue of which it is affectible, and properly a patient) and a relation between agent and patient. Intrinsic properties of agent and patient and the relation of agent to patient are mentioned separately in statements of [A] at *Phys.* 8.1, 251^{b}1–5, and *GA* 2.4, 740^{b}21–4 (statements at *Phys.* 8.4, 255^{a}34–255^{b}1, and *MA* 8, 702^{a}12–15, are more compressed).

Later in the chapter (1048^{a}11–13) Aristotle will state:

[C] As regards two-way capacities: necessarily (if agent and patient are in the right condition and related in the right way, and the agent chooses to act, then action results).

The antecedent of [C] mentions the following factors: the agent's choices ('whichever it desires decisively' (1048^{a}11–12)), the intrinsic condition of agent and patient ('when it is in the condition to be capable' (1048^{a}12)), and the relation between agent and patient ('and approaches the patient' (1048^{a}12–13)). Take the example of building. [C]'s antecedent covers the builder choosing to build; the builder being in the right condition to build (for example, awake, healthy, sober), the materials being in the right condition to be built with (for example, the bricks baked, the wood seasoned), and the builder being appropriately related to the materials (for example, in the same place as the bricks and wood, which are light enough for him to lift).

Neither [A] nor [C] as I have formulated them refers to factors external to agent and patient in its antecedent. Aristotle's statements of [A] and [C] at 1048^{a}5–7 and 1048^{a}11–13 do not incontrovertibly establish whether or not [A] and [C] should include reference to external factors. But it becomes clear later in the chapter (1048^{a}16–21) that, speaking strictly, Aristotle prefers [A] and [C] to alternative formulations which do include reference to the absence of external hindrances in their antecedents. *Phys.* 8.1, 251^{b}1–5, *Long.* 3, 465^{b}14–16, and *GA* 2.4, 740^{b}21–4, suggest the same (although other passages are less straightforward—for example, *Phys.* 8.4, 255^{b}3–31; *An.* 2.5, 417^{a}27–8; *MA* 8, 702^{a}10–17; *Met.* Θ7, 1049^{a}7, 13–14). For further discussion see §11 below.

4. Is [A] a Determinist Claim?

A number of commentators have taken [A] to be a determinist claim, and the assertion of [A] in this chapter has been adduced as relevant to a wider debate concerning Aristotle's general position on determinism (see e.g. Sorabji 1980: 51–6, 135–7). But, putting consideration of Aristotle's general position to one side, it is worth noting that the determinist implications of [A] are in fact quite weak. In order to appreciate this, it is important to recall the distinction (Commentary, Chapter 2, §4) between normal, interfering, and preventative (blocking) conditions, and particularly the point that a capacity may be exercised in interfering conditions, although in a non-standard or improper way. A determinist world view holds that the state of the world at one time (along with the laws of nature) necessitates its state at later times. Determinism about efficient

causes would be the view that, if an efficient cause brings about an effect, then it is necessary that the effect obtain given that the cause operated. In contrast, [A] makes a much more limited claim: what is necessary is that that the *standard* or *proper* exercise of a capacity occurs in *normal* conditions. Suppose S has the capacity to ϕ and is in normal conditions—conditions, that is, in which nothing either interferes with or prevents S's exercising its capacity to ϕ. Then, according to [A], it is necessary that, being in normal conditions, S will ϕ. However, that leaves two further aspects of S's behaviour open:

(i) S's ϕ-ing might also be an instance of *ψ*-ing, and [A] does not say that it is necessary that (if S has a capacity to ϕ and is in normal circumstances for ϕ-ing then S will *ψ*). That A's ϕ-ing also works out as *ψ*-ing may be wholly contingent, depending on accidental background conditions. For example, suppose a fire has the capacity to burn some wood, that this fire is in the right condition and the right relation to some wood to burn it, that it does burn the wood, and that in doing so it produces smoke in a particular pattern and drives some bees from their hive. [A] does not say that the latter effects follow of necessity given that the fire is in the right circumstances for burning wood.

(ii) [A] does not say anything at all about what S will do in conditions which *interfere* with the capacity to ϕ. Since these are interfering, rather than preventative, conditions, the capacity to ϕ will issue in some change. [A] does not say that the interfering conditions determine *what* that change will be. Take a non-Aristotelian example. Suppose a moving billiard ball has the capacity to move in a straight line. Circumstances in which it collides with another billiard ball would interfere with the exercise of that capacity. [A] allows that what follows on that collision could be a contingent matter: that the moving ball might be deflected left, or right, or bounce back. It is not even ruled out that an exercise of the capacity to ϕ in interfering conditions should as it happens turn out to be an instance of ϕ-ing. For example, a shoot has the capacity to grow straight; if there are bricks in the way, the exercise of that capacity will be interfered with; the shoot's growth will be guided by the interfering bricks, rather than being a normal exercise of its capacity to grow straight; but it might just happen that growing along the gaps between the bricks will result in straight growth.

Given (i) and (ii), a world of which [A] was true could admit of a good deal of indeterminism, in the sense that the state of the world and the capacities of the bodies involved at one time would *not* necessitate the state of the world at any later time. For example, some of the trees in a forest will be able to grow unhindered, and it would be necessary that those trees grow straight, produce leaves and fruit; however, the growth of other trees would be hindered, and their twisted growth, stunted leaves, and deformed fruit might be undetermined.

5. $1047^{b}35–1048^{a}2$: Aristotle's First Premiss

Before stating [A] at $1048^{a}5–7$, Aristotle gives one of the premisses on which he will rely throughout the chapter ($1047^{b}35–1048^{a}2$: '*since* what is capable . . .'). This premiss can be understood in two different ways:

CONT What is capable is capable of something-at-some-time-and-in-some-way-etc.

POSS What is capable is capable of something and [it is capable] at some time and in some way, etc.

In either case Aristotle's point concerns the need to qualify capacities. According to CONT, it is qualifications of the *content* of a capacity which are at issue, while, according to POSS, the claim concerns conditions under which a capacity is *possessed*. Suppose that strong winds or blindness would stop a builder putting up a house. Some qualification of the builder's capacities is in order. CONT recommends some qualification of *what* the builder is capable of: properly speaking his capacity is to build-in-the-absence-of-strong-winds-when-sighted. POSS says something about *when* he is capable of building: only when strong winds are not blowing and he is sighted.

The CONT/POSS distinction is important, since the thought that capacities need to be qualified runs through this chapter ($1048^{a}6$, 12, 14, 17–20). None of these later passages determines the choice between CONT and POSS. So the decision between them will rest on which provides the more interesting reading of the chapter.

One reason to hope that Aristotle has CONT rather than POSS in mind is that CONT introduces a more philosophically perplexing issue. The question POSS raises is: how should we distinguish among conditions between those which do, and those which do not,

rule out the possession of a capacity? For example, is the (rational) capacity to build retained when there are no bricks available, or when strong winds prevent the erection of walls, or when the builder is drunk, or paralysed, or in his dotage? A plausible answer is that hindrances *external* to the agent are always consistent with his continued possession of the capacity; whereas at least some *internal* hindrances are not so consistent. For example, the builder retains his capacity when there are no bricks available, or when strong winds are blowing, but loses it when drunk or paralysed or in his dotage (though not when his hands are in his pockets, or his eyes are closed). Aristotle says at *Θ*3, 1047^{a}1–2, that a craft capacity can be lost 'either by forgetting or by some misfortune or through time', which suggests sympathy with this plausible answer.

CONT, on the other hand, adverts to a far more open question, which is certainly important in its own right. If capacities are to be useful in explanation, it must be possible to attribute capacities to objects. Observation will play *some* role in that attribution (I discover the natural capacities characteristic of a frog or oak tree by careful observation of frogs and oaks). But the raw data supplied by observation are just that under different conditions different results occur (when there is this much sunlight and rain, acorns appear; when there is more sunlight and less rain, no acorns appear; when there is less sunlight and more rain, stunted growths appear). How is one to decide on the basis of such observations *which* capacity to attribute: which conditions are to be included in the content of the capacity, and which are to be seen as either enabling or preventative background conditions?

There are two opposed errors to be avoided. One error would be to include *all* conditions in the content of a capacity; the other error would be to include *none*. On the one hand, if all conditions are included, capacities proliferate wildly. Suppose an oak produced acorns when the temperature is 20°C, there are fourteen hours of daylight, and soil pH is 6.5; and that it continues to produce acorns when the temperature drops to 19°C, and so on. If we included all conditions in the content of a capacity, then we would have to say that the oak would not be exercising a single capacity in different circumstances, but manifesting two distinct capacities, to produce-acorns-when-temperature-is-20°C, etc., and to produce-acorns-when-temperature-is-19°C, etc; and in that case a general

explanatory perspective on the oak's activities in different circumstances would be lost. On the other hand, to relegate all conditions to the status of background conditions would be to treat capacities as mere *dispositions*. Suppose an oak produces acorns when the temperature is 20°C, there are fourteen hours of daylight, and so on, but produces wood knots when the temperature is 10°C, there are six hours of daylight, etc. These would simply be two distinct reactions by the tree to different sets of conditions, and there would be no grounds for saying that in the second case the oak had been *prevented* from producing acorns by unfavourable conditions: producing wood knots is just what an oak does in those circumstances. So, since it would be wrong both to include *all* and to include *no* conditions, then there should be some principled way of specifying just *some* conditions which are to be built into the content of a capacity. On the CONT reading of $1047^{b}35–1048^{a}2$, 'at some time and in some way . . .' refers to just those conditions.

So CONT suggests a substantive philosophical question, and one which it is not easy to answer: how are those conditions to be specified, and the content of a capacity identified? Initially two answers to that question suggest themselves. One identifies the content of a capacity with what its bearer does under *ideal* circumstances. We find out what capacities something has by seeing what it does in circumstances in which nothing else is operating (for a contemporary statement of this approach see Cartwright 1989: ch. 5.2, pp. 185–91). This approach works well for examples from basic sciences like mechanics, since bodies will, for example, exhibit motion in circumstances in which no other factors are present. It is less useful in the case of higher sciences. The natural capacities of an oak cannot be identified with what it does in rigorously ideal circumstances, since an oak will die in the absence of oxygen, water, carbon dioxide, soil nutrients, etc. Nor could the oak's capacities be identified by seeing what it does when no *interfering* factors are operative, since whether or not a factor is an interfering factor for a capacity cannot be decided independently of knowing what the capacity in question is.

An alternative approach identifies the content of a capacity *teleologically*. We attribute to the oak a capacity to produce acorns, rather than a capacity to produce wood knots, because it is the production of acorns which is good for an oak tree, and contributes to the flourishing of the species. So conditions in which an oak produces wood knots can be identified as interfering conditions; and then by

contrast other conditions are picked out as conditions which enable the capacity to be exercised.

This is a promising approach in the biological sciences, and might appeal to Aristotle. But it is less appropriate to the lower sciences and higher non-biological sciences. Modern champions of capacities (tendencies or powers) will attribute explanatory tendencies to bodies (to move in a straight line) or commodity prices (to increase in line with an increase in money supply), without supposing that anything is *good* for moving bodies or commodity prices.

A final point concerning CONT is that the issues which it brings to the fore are relevant to the debate between Aristotle and his Megarian opponents in *Θ*3. I suggested in the Commentary on that chapter that the Megarian position relies on a very strong claim about the content of capacities: that all capacities have a temporally specific content and are properly synchronic (Commentary, Chapter 3, §2). In that case, issues concerning capacity content are already on the table. Further, Aristotle and the Megarians will disagree on whether capacities are *transparent* (we can read off what capacities something has from what it does, and see what changes the exercise of a capacity will issue in), *semi-transparent* (we can see what changes the exercise of a capacity will issue in, but cannot read off what capacities something has from what it does), or *opaque* (we cannot read off what capacities something has from what it does, nor can we see what changes the exercise of a capacity will issue in). More formally:

> A capacity to ϕ is *transparent* iff (i) A ϕ's → A has the capacity to ϕ, and (ii) A has the capacity to ϕ → any exercise of that capacity is (*inter alia*) an instance of ϕ-ing.
> A capacity to ϕ is *semi-transparent* iff (i) it is possible that (A ϕ's and A does not have the capacity to ϕ), and (ii) A has the capacity to ϕ → any exercise of that capacity is (*inter alia*) an instance of ϕ-ing.
> A capacity to ϕ is *opaque* iff (i) it is possible that (A ϕ's and A does not have the capacity to ϕ), and (ii) it is possible that some exercise of A's capacity to ϕ should not (even *inter alia*) be an instance of ϕ-ing.

The Megarian treats all capacities as semi-transparent. Any exercise of Dr Finlay's capacity to heal at noon will be an instance of healing at noon, but will also be an instance of healing *simpliciter*; and a Megarian will not allow that it follows from Dr Finlay's healing

simpliciter that he possesses the capacity to heal *simpliciter* (since a Megarian denies that there really are capacities like that, with temporally non-specific content). For Aristotle, in contrast, capacities are opaque. A heavy body's natural capacity to move to the centre of the universe might be exercised in its deforming a shelf it is resting on; and a tree's natural capacity to grow straight might, if the tree is hemmed in, give rise to twisted branches. Aristotle needs to consider the issues raised by CONT (namely, the identification of certain conditions as interfering or preventative, and their relation to the content of a capacity) in order to sustain a view of capacity content against the Megarians, which will allow him to preserve the opaque status of capacities.

That capacities should, for Aristotle, be opaque, might seem inconsistent with the conclusion established in *Θ*2 (1046^{b}7–15) that non-rational capacities are one-way capacities. For opacity seems to require that there can be exercises of the capacity to ϕ which are not even *inter alia* instances of ϕ-ing; whereas a non-rational capacity's being one way seems to entail that any exercise of the capacity to ϕ is (perhaps *inter alia*) an instance of ϕ-ing. Recall, however, the distinction drawn between normal, interfering, and preventative conditions. To say that non-rational capacities are one-way capacities is to say that *in normal conditions* any exercise of a non-rational capacity to ϕ is (perhaps *inter alia*) an instance of ϕ-ing. To say that non-rational capacities are opaque is to allow that there can be exercises of the non-rational capacity to ϕ which are not even *inter alia* instances of ϕ-ing: namely, exercises under *interfering* conditions. Rational capacities are two-way capacities because *in normal conditions* there can be exercises of a rational capacity to ϕ which are not (even *inter alia*) instances of ϕ-ing.

6. 1048^{a}2–5, 8–10: Aristotle's Second Premiss

CONT is not, by itself, sufficient to support [A] and [C]. In addition, Aristotle appeals to the distinction between rational and non-rational capacities drawn in *Θ*2 (1048^{a}2: 'some things can produce changes in accordance with reason . . .'; 1048^{a}8: 'For all these latter . . .'). So—separating his claims about non-rational and rational capacities—Aristotle has three premisses at his disposal:

P1 What is capable is capable of something-at-some-time-and-in-some-way-etc. (1047^{b}35–1048^{a}2, understood as CONT).

P2 Some capacities to ϕ are such that any exercise of the capacity in normal conditions is (at least *inter alia*) an instance of ϕ-ing (1048^a8).

P3 Some capacities to ϕ are such that there can be exercises of the capacity in normal conditions which are not (even *inter alia*) instances of ϕ-ing (1048^a8–9).

[A] will be established if it can be shown of capacities satisfying P2 that necessarily (if agent and patient are in the right condition and related in the right way, then action results). If that can be shown *not* to hold of capacities satisfying P3, then [B] is established. And [C] will be established if it can be shown of capacities satisfying P3 that necessarily (if agent and patient are in the right condition and related in the right way, and the agent chooses to act, then action results).

7. Is there a Good Argument for [A]?

[A] may well appear implausible to many readers. For it seems that, contrary to [A], many capacities are probabilistic. For example, all that follows from a radium atom's being in normal conditions for setting off a Geiger counter is that *probably* it will set the counter going—it might fail to do so without anything preventing it or interfering with it. However, there is an argument for [A] which appeals to premisses P1 and P2, and which has a certain degree of plausibility.

According to P2, there is a single common description to be provided of any outcome which is the exercise of a single capacity in normal conditions; and, according to P1, it will be necessary to qualify the content of a capacity in the course of arriving at that description. It is not necessary to say precisely *how* the content of a capacity should be qualified in light of the identification of certain conditions as hindrances and prerequisites, and P1 does not do so (there is more about this at 1048^a16–21; see §11 below). But, if there is to be *any* qualification of the content of a capacity such as P1 requires, then we have to be able to make sense of there being external hindrances to the exercise of a capacity. If we could not make sense of a factor's *hindering* the exercise of a capacity, then we could not identify hindering factors, and so could not satisfy P1 (read as CONT) by considering *which* are to be included in the content of the capacity. And it is tempting to hold that if [A] were false then

it would not make sense for there to be external hindrances to the exercise of a capacity, and thus it would be impossible to arrive at the properly specified content of a capacity as required by P1 and P2. So, contraposing, given the requirements of P1 and P2 concerning capacities, it follows that [A] is true.

Why should anyone think that the falsity of [A] makes it impossible for there to be external hindrances to the exercise of a capacity? Everything here will hang on a satisfactory account of the notion of *prevention*. For a factor F is an external hindrance to the exercise of a capacity to ϕ if the presence of F in a situation *prevents* something with the capacity to ϕ exercising that capacity. Strong wind is an external hindrance to an electric ring's igniting a piece of paper in so far as the wind prevents the paper catching fire. The tempting thought then is that F could be identified as an external hindrance to the exercise of a capacity to ϕ only if the capacity *would* have been exercised in that situation had F not been present—if the presence of F is the reason for the capacity's not being exercised. For example, strong wind can be identified as an external hindrance to the ignition of the paper only if a certain counterfactual is true: that the electric ring *would* have ignited the paper had the wind not been blowing. But that counterfactual is not true if [A] is false. For, if [A] is false, then a capacity to ϕ is just intrinsically liable not to issue in ϕ-ing. Consider strong winds blowing on dry paper in contact with a hot electric ring. If [A] is false, we have no reason to say that the paper would have ignited had the wind not been blowing, since there could well be a parallel situation, differing only in that the wind is not blowing, and in which the paper nevertheless does not ignite. So (the argument will go), if [A] is false, it is impossible to identify external hindrances to the exercise of a capacity. For, if [A] is false, there is no condition such that a paper would have ignited had that condition not been present, and so nothing which *prevents* the ignition of the paper. But, if external hindrances cannot be identified, then it is impossible to arrive at the qualifications required by P1 and P2. So, given P1 and P2, we should conclude that [A] is true.

This argument raises difficult questions. First, someone could deny that the notion of something's hindering the exercise of a capacity has any modal content. Perhaps all that is required for F to prevent the exercise of a capacity to ϕ is just that the capacity is never *in fact* exercised in situations in which F is present. In that

case, the move from a claim about prevention (F prevented ϕ-ing) to a counterfactual (ϕ-ing would have occurred had F not been present) will be blocked. Second, even if the truth of some such counterfactual *is* required for a factor to prevent the exercise of a capacity, an opponent could try to interpret the counterfactual itself probabilistically. For example, it could be claimed that F prevents the occurrence of ϕ-ing so long as ϕ-ing does not occur if F is present, and the probability of ϕ-ing occurring were F absent is sufficiently high. Each of these moves invites further responses. All I wish to note, however, is that there is an argument here from premisses P1 and P2 to [A] that is at least both tempting and engaging.

A final point concerning [A]. An alternative way of saving a limited version of [A] would be to insist that Aristotle does not mean to assert [A] in a strict and universal form. That is not to say that he has some subtle and determinate qualification to [A] in mind, but rather that he is adverting in a more rough-and-ready way to a general view: that capacities—a type of potential being—inevitably give rise to actual exercises in the right conditions. His concern in this chapter, it could be said, is not with the defence of detailed claims about the natural world, but with a broader metaphysical thesis concerning the relation of potential and actual being. I have not approached [A] in that way. For, even if that is Aristotle's explicit concern in *Met. Θ*5, an important question remains. Underlying Aristotle's broad brush claim in the present chapter about the relation between capacities and their exercise there must be some more determinate conception of a capacity: is there anything in that conception which would allow a defence of a full-blown version of [A]?

8. 1048ª7–10: An Argument for [B]

The second main claim which Aristotle makes in this chapter is that the precise parallel to [A] fails for rational capacities:

[B] As regards two-way capacities: not necessarily (if agent and patient are in the right condition and related in the right way, then action results).

Lines 1048ª8–10 give Aristotle's grounds for [B]. The argument looks clear. However, difficulties arise when we take into account Aristotle's later response to a possible objection to [C] (1048ª21–4, §12 below).

The argument for [B] seems to run as follows. Suppose that agent and patient are in the right condition, and are appropriately related, for a two-way capacity to be exercised. In that case the capacity *could* be exercised in two opposed ways. So, if a precise parallel to [A] held of two-way capacities, then necessarily the capacity *would* be exercised in two opposed ways. Suppose that doctor and patient are in the right condition (for example, the doctor has full medical knowledge, and the patient is responsive to treatment), and that they are appropriately related (for example, the patient will take the drugs and follow the treatment prescribed by the doctor): then, if a parallel to [A] were true of the doctor's two-way medical capacity, both health and harm would result. But that is impossible. So [B] follows: the precise parallel to [A] fails for two-way capacities.

Now a principle related to [A] *does* hold of two-way capacities (1048^{a}11–13):

[C] As regards two-way capacities: necessarily (if agent and patient are in the right condition and related in the right way, and the agent chooses to act, then action results).

In the right circumstances it is the agent's desire or rational choice which will settle which of the two possible outcomes actually occurs. Let a doctor be appropriately related to a patient in a suitable condition: if he *chooses* to heal, then healing will result, and if he *chooses* to harm, then harm will result. Later (1048^{a}21–4) Aristotle considers an objection to [C] which parallels his own argument for [B]. What if the doctor wants to heal *and* wants to harm? If [C] were true, it might seem that, *per impossibile*, both healing and harming would result. Aristotle's reply to that objection consists in attending more carefully to the correct specification of the doctor's two-way capacity. It will turn out that the proper specification of the doctor's two-way capacity involves temporal qualifications: it is a capacity to heal-and-harm-at-different-times. But specifying the capacity in that way undercuts Aristotle's own argument for [B]. Suppose *that* capacity were necessarily exercised in the appropriate conditions. The result would not be an impossibility, but healing-and-harming-at-different-times.

Further, it would not matter if I were wrong on the details of Aristotle's account of how the content of two-way capacities should be correctly specified. The strategy Aristotle later adopts in 1048^{a}21–4 is still bound to cause trouble as regards his argument

for [B]. For in 1048ª21–4 he does not at all focus on the supposition that the doctor's desires could be in conflict—all his attention is on the content of the doctor's rational capacity (1048ª22–3: 'for it is not in this way that he has the capacity for them, nor is it a capacity to do them at the same time'). So, whatever account he gives of two-way capacity content in connection with [C] will threaten to undercut his own argument for [B], where appeal to desires and choice is also irrelevant.

9. 1048ª10–15: An Argument for [C]

Aristotle's strongest argument for [C] is an adaptation of the argument offered for [A] in §7. The content of rational two-way capacities requires careful specification, just as does the content of non-rational one-way capacities, and the qualifications will involve identifying external hindrances to the exercise of a rational capacity. If a factor F is to be an external hindrance in a particular situation to the exercise of a rational capacity to ϕ, it should be true that the capacity would have been exercised in the way the agent chose had F not been present in that situation. For example, it will be true that bad light prevented the doctor curing his patient only if it is true that the doctor would have cured his patient had he chosen to and had the light not been bad (and similarly *mutatis mutandis* for the doctor's harming his patient). But, if [C] is false, then that counterfactual is never true, for the medical craft which is the two-way capacity to heal and harm would then be intrinsically liable not to issue in changes which would be its exercise. Suppose the light is good, and the doctor and patient are in just the same condition and relation to one another as when the light was bad; and that the doctor chooses to heal, and acts in just the same way as he did when the light was bad—but the patient nevertheless still fails to regain his health. Then it is surely not true that it was the *bad light* which prevented the doctor healing the patient.

The responses to this argument are parallel to those considered in §7 to the corresponding argument for [A]: I will not rehearse them here.

10. 1048ª15–16: Possessing a Capacity or Being Possible?

Both this sentence and the material following (1048ª16–21, 1048ª21–4) are difficult. The opening words pick up 'whenever

it desires that for which it has the capacity' at 1048^{a}14 (recall Introduction, §3, on translation of the noun *dunamis*). The occurrence of 'capacity' at 1048^{a}14 requires '[the capacity]' and '[its capacity]' as supplements at 1048^{a}15. However, it is not clear whether 1048^{a}15–16 is in fact best interpreted as a claim about the conditions under which something possesses an active capacity as defined in *Θ*1 (1046^{a}10–11: an origin of change in something else)—namely, the claim that something possesses a capacity only when there is an appropriate patient present, in a suitable condition. First, that claim would be extremely implausible. It would, for example, be the view that someone is a builder (that is, possesses the building capacity) only when there are bricks and wood present which are suitably baked and seasoned; and that, if there are no bricks or wood in Candy's vicinity, or if they are ill-baked or warped, then Candy lacks the capacity to build (*Θ*3, 1046^{b}34–5: she is not a builder). Second, it would be at odds with Aristotle's sensible comments on capacity gain and loss at *Θ*3, 1046^{b}36–1047^{a}2. The view there is that Candy acquires the building craft by learning (compare *Θ*5, 1047^{b}32–4), and she loses it, for example, by forgetting: but the implication of taking 1048^{a}15–16 as a claim about capacity possession would be that she could gain the building capacity because someone places bricks in front of her, and lose it when they are removed. Third, there would be a tension with *Θ*1, 1046^{a}19–29, on the non-identity of active and passive capacities, which rested on the thought that active (passive) capacities exist due to facts about the agent (patient): for this interpretation of 1048^{a}15–16 would suggest that whether Candy possessed an active capacity to build could depend as much on facts about bricks, for example, whether they are well baked, as it does on facts about Candy, for example, whether she understands what it is for something to be a house (recall Commentary, Chapter 1, §6).

There is an alternative interpretation available. First, the sentence would be much more plausible if understood as a claim about the conditions under which it is *possible* that something act. If there are no bricks present, or they are unbaked, then it is not possible that Candy build, even though she possesses building skills. Second, this would be in line with *Phys.* 8.7, 260^{b}1–5, which suggests that the upshot of an agent and patient coming into the right relation (for example, a pan of cold water being placed on the fire) is that what was previously potentially ϕ (the water which had the passive

capacity to be heated) becomes actually ϕ (the water's passive capacity issues in a rise in temperature), rather than that a patient comes to be potentially ϕ (comes to possess a capacity). Third, *Phys.* 8.1, 251^{b}1–8 is also best read as a claim that an agent's being in the right relation to a suitable patient does not fix whether an agent possesses a certain capacity, but whether it is possible that it exercise that capacity.

Fourth and finally there is the following argument. The absence of a suitable patient will *prevent* an agent exercising a capacity: what *stops* Candy building is that the bricks have not yet been delivered. Now, if A is prevented from ϕ-ing, then certainly it is *false* that A is ϕ-ing. But that is not all there is to it. The main result of *Θ*4 was that there is a distinction within what is false between the (merely)-false-but-possible, and the (not-merely-false-but-also)-impossible. In commenting on the *Θ*3 modal test I suggested that it characterizes different types of possibility, according to how accommodating one is when making an assumption in order to test for consistency (Commentary, Chapter 3, §9). Whether we want the test to capture a certain type of (im)possibility depends on whether we have intuitions that there really are (im)possibilities of that type worth capturing. Now consider a case in which Candy is not building because the absence of bricks *prevents* her doing so. There is a sense, well worth capturing, in which it is not merely false but also impossible that she is building. For suppose that, in addition to not building, it is also the case that she is not moving her arms in particular ways, although nothing *stops* her moving her arms like that (certainly the absence of bricks does not stop her doing so: she could have moved her arms about in order to see whether she would have been up to the strain of building had the bricks been delivered on time; compare also §4 above on the degree to which [A] and [C] allow for chance outcomes). We capture this difference—the respect in which it is impossible that she is building, but merely false that she is moving her arms in certain ways—by holding fixed a limited range of contingent facts when testing the supposition, that she build, for possibility: the absence of bricks is a causal antecedent of the putative possibility, the occurrence of certain arm movements is not. I take 1048^{a}15–16 to be about precisely the type of impossibility which is at issue when we say that the absence or unsuitability of materials *prevents* an agent exercising a capacity.

For these reasons I will interpret 1048ª15–16 as a claim concerning the conditions under which it is possible that something exercise its capacities, rather than the conditions under which it possesses those explanatory capacities. The purpose of the claim will become clearer in comments on 1048ª16–21 and 1048ª21–4.

When understood as a claim about possibility, passage 1048ª15–16 generates a striking consequence. The two main results of *Θ*5 are:

[A] As regards one-way capacities: necessarily (if agent and patient are in the right condition and related in the right way, then action results);

and:

[C] As regards two-way capacities: necessarily (if agent and patient are in the right condition and related in the right way, and the agent chooses to act, then action results).

Further, according to 1048ª15–16, if the patient is absent or in the wrong condition, then it is not possible that the agent act. And, when conjoined with [A] and [C], that gives:

[A*] As regards a one-way capacity to ϕ: necessarily (if it is possible that an agent exercise its capacity to ϕ on a patient then it will do so);

and:

[C*] As regards a two-way capacity to ϕ: necessarily (if it is possible that an agent exercise its capacity to ϕ on a patient, and the agent chooses to do so, then it will do so].

[A*] and [C*] are striking because they entail, for example, that, if this fire is not in fact heating that pan of water, then it is not possible that it be doing so; and that, if Merle is not in fact healing Candy, then either it is not possible that he be doing so or he does not choose to do so. But how could Aristotle endorse [A*] and [C*], having just argued that there is a genuine distinction between the possible and the actual (*Θ*3, 1047ª18–24; *Θ*4, 1047ᵇ12–14)?

The crucial point is that [A*] and [C*] are extremely circumscribed claims. Consider [A*], which is the simpler of the two claims. Suppose A has a one-way capacity correctly specified as a capacity to ϕ; and suppose it is possible that A exercise that capacity

on B in the sense that nothing about B prevents A from ϕ-ing B; then A will ϕ B. Equivalently: if A is not ϕ-ing B, then either A does not have a one-way capacity correctly specified as a capacity to ϕ, or there is something about B which prevents A from ϕ-ing B—something which explains why A cannot ϕ B. The claim is limited in two ways. First, it applies only to changes which are the *proper* exercise of A's capacities. If a fire is not heating something up, then it cannot do so. It does not follow that if a fire is not scorching something in a particular way, or heating something to a particular temperature, or destroying a valuable painting, then it cannot do so. I put the cake mix in the oven and it comes out soggy. [A*] does not require that something about the cake mix *prevented* the hot oven from baking it properly: cakes are complicated mixtures of stuff, cooking is an inexact process, and lots of possibilities simply fail to be actual. All that [A*] does require is that, if the oven was indeed hot and nevertheless did not *heat* the cake mix, then something about the mix or its position in the oven (its relation to the gas flame) *stopped* it doing so.

Second, [A*] concerns a very specific type of (im)possibility. If a fire is not doing any burning, then it is not possible that it do any burning, in the sense that the absence of combustible material from its vicinity prevents it doing so. But the fire still has a capacity to burn (that is, it is an origin of combustion in appropriate materials); and it may be possible that the wind blow dry grass onto the fire, so that it is no longer prevented from burning. Aristotle's position in *Θ*3 is that his Megarian opponents have such an impoverished modal outlook that they cannot avail themselves of any such distinctions. Their view is, for example, that, if Candy is not seeing, then she cannot see, and they are in no position to object when Aristotle interprets that as the claim that she does not have the relevant capacity (*Θ*3, $1047^{a}7$–8: note the phrase 'possess perception'), and is therefore blind. Aristotle's own view is that, even when Candy is not seeing, there are various respects in which she can, and various respects in which she cannot, see. If the lights are out, then her visual capacities cannot be exercised; nevertheless she is sighted, and therefore possesses the relevant perceptual capacity; perhaps she is not seeing clearly, because of the mist, so that in one sense we will say she can, in another that she cannot, see (*Met.* *Δ*12, $1019^{a}23$–6); and, while there is a sense in which external conditions—features of the world apart from agent and patient and their relation to

one another—do prevent a capacity being exercised, speaking more strictly, they should rather be built into a proper specification of the capacity in question (1048^{a}16–21; see §11 below).

Finally, [A*] and [C*] highlight a fact about capacities that is extremely significant for Aristotle's overall discussion in *Met. Θ*. Take the focal case of an active capacity (*Θ*1, 1046^{a}9–11). To say that A has an active capacity to ϕ is not just to say that A *can* ϕ, nor even that A *will* ϕ *if certain conditions obtain*: it is to say that A *will* ϕ *unless prevented*. An active capacity is neither a bare possibility nor a disposition. It is a tendency or power, a striving to produce actual changes which fails to do so only if something stops it. The case is similar with rational capacities, once choice directs them to one or another outcome (the same point is apparent in Aristotle's characterization of nature as an innate *impulse* for change at *Phys.* 2.1, 192^{b}18–19). [A*] and [C*] make that feature of capacities explicit: fire heats whenever possible, a trained doctor who chooses to heal will do so if she possibly can.

These points are picked up later in *Θ*7–8. In *Θ*7 (1048^{b}37–1049^{a}18) the notion of an active capacity to ϕ, the focus of discussion in *Θ*1–5, is used to explain something's being potentially F (for example, what it is for something to be potentially a house is explained by reference to the capacity to build). Something does not count as potentially an F simply because it *could* become an F (this acorn *could* become a deformed and stunted sapling, but it is potentially an oak and not potentially a deformed sapling); nor does something count as potentially an F simply because it *will* become an F *if certain conditions obtain* (this mass of clay will become a house if it is dug from the ground, properly treated, shaped into bricks, baked in an oven, structured into walls, and so on; but clay in the ground is not potentially a house). Rather, something is potentially an F if it is possible to turn it into an F by an exercise of the appropriate capacity—that is, if nothing about it prevents an exercise of the appropriate capacity turning it into an F (*Θ*7, 1049^{a}2–4, 8, 9–11; see Commentary, Chapter 7, §§3–6 for further details).

Further, the fact that an active capacity to ϕ issues in ϕ-ing unless it is prevented from doing so contributes to the conclusion of *Θ*8, that actuality is prior to potentiality (see especially the discussion of priority in substance at *Θ*8, 1050^{a}4–1050^{b}6). Just as something hot will produce heating unless something gets in the way, so too a fertilized egg (something potentially human) will

develop into an adult (something actually human) if it possibly can and so long as nothing prevents it (compare *Θ*7, 1049ª13–18). That feature of natural generation and development will turn out to be closely connected with Aristotle's arguments that actuality is prior to potentiality in substance (see Commentary, Chapter 8, §§6–9 for further details).

11. 1048ª16–21: External Hindrances

Aristotle now engages with a question which he has been able to finesse for most of the chapter: namely, how the content of a capacity should properly be specified (see also 1048ª21–4 following, which rests on the present passage; and Moline 1975 for discussion).

Here is an objection to [C]. Suppose I am an expert builder with the appropriate two-way capacity; and that there are planks and bricks suitable for being built in front of me; and that I choose to build. Then the antecedents of [C] are satisfied. Nevertheless, building might not occur. Perhaps very strong winds are blowing which flatten walls as soon as I erect them. So it seems [C] is false, and should be amended to

[C-ext] As regards two-way capacities: necessarily (if agent and patient are in the right condition and related in the right way, and the agent chooses to act, *and nothing external prevents him from acting*, then action results).

Since [C] differs from [A] only as regards reference to an agent's choices, [A] is vulnerable to a parallel objection. Suppose an electric ring is switched on (the agent is in the right condition to act), a piece of paper is dry (the patient is in the right condition to be affected), and the paper is touching the ring (agent and patient are appropriately related). Then the antecedent of [A] is satisfied. Still the paper might not be ignited. For it might be that winds are blowing which prevent any flames taking hold. So it seems [A] is false, and should be amended to:

[A-ext] As regards one-way capacities: necessarily (if agent and patient are in the right condition and related in the right way, *and nothing external prevents the agent acting*, then action results).

The general line of Aristotle's reply is clear. [A] and [C] do not need to be amended, because the presence of external hindrances

is ruled out by the correct specification of the capacity in question ($1048^{a}20–1$). But beyond that lie three main difficulties:

(*a*) Why should Aristotle want to resist amending [A] and [C] to [A-ext] and [C-ext]?
(*b*) How does reference to the correct specification of a capacity deflect the objection that [C] and [A] are, as they stand, false?
(*c*) Is it plausible to claim that the absence of external hindrances should be included in the content of capacities?

(*a*) Why does Aristotle go to such trouble to avoid including a reference to external conditions in [A] and [C]? What would be wrong with [A-ext] and [C-ext]? These questions are particularly pressing in view of the fact that Aristotle does not always abide by the strict policy he advocates here. For example, *Phys.* 8.4, $255^{b}3–31$, emphasizes the significance of external hindrances in accounting for the natural motion of inanimate elements (although in that case we do not have a clearly distinct agent and patient); there are also references to external prevention at *An.* 2.5, $417^{a}27–8$; *MA* 8, $702^{a}10–17$; and in an allusion to [C] at *Met.* Θ7, $1049^{a}7$ (compare Θ7, $1049^{a}13–14$). Further, what is special about *external* hindrances? Both strong winds and the absence or unsuitability of appropriate building materials prevent Candy building (recall $1048^{a}15–16$): why are external conditions to be excluded from, while reference to an appropriate patient is included in, the antecedents of [A] and [C]?

Consider the place of [A] and [C] in the wider context of *Met.* Θ. Aristotle's topic in *Met.* Θ is potentiality and actuality. The discussion in Θ1–5 of capacities and change is important because of what it shows about potentiality and actuality more broadly conceived (Θ6, $1048^{a}30$). Θ1–5 explains that there are correlative active and passive capacities (Θ1, $1046^{a}9–16$), whose connection with one another is complex (Θ1, $1046^{a}19–29$); and that it is necessary when the right active and passive capacities stand in the right relation to one another that they are jointly actualized and result in a change (Θ5). If a patient is in the wrong condition (the paper is wet), or is not in the right relation (it is not near the fire), then an agent's active capacity will not be actualized (the hot fire will not do any burning). Similarly, if an agent is in the wrong condition (the fire is damped down) or is not in the right relation (not near the paper), then a patient's passive capacity will not be actualized (the combustible paper will not be burned). [A] and [C] make the crucial

point: that change is the inevitable actualization of two capacities (two origins of change). [A-ext] and [C-ext] obscure that point by treating agent and patient as just two factors among the whole range of external conditions. For example, according to [A-ext], burning is no more due to the heat of a fire or the combustibility of paper than it is to the presence of oxygen in the air, the absence of rain, or the stillness of the wind.

Aristotle resists [A-ext] and [C-ext] because it is important for him to privilege the role of active and passive capacities (agent and patient); and it is important for him to do that because it is the active and passive capacities which stand to the change as something potential to something actual. It is plausible to think of a hot fire as something potentially burning, and of combustible paper as something potentially being burned, and the inevitable result of their interaction as fire actually burning paper. In contrast, it is not plausible to think of external conditions (wind, rain, oxygen, and so on) in terms of potentialities directed towards burning. [A] and [C] preserve, while [A-ext] and [C-ext] elide, that difference between agent–patient and external conditions. So [A] and [C] do, while [A-ext] and [C-ext] do not, contribute to *Θ*'s overall concern with potentiality and actuality. That is why Aristotle is particularly concerned to recommend [A] and [C] over [A-ext] and [C-ext] in this chapter, which is the culmination of his discussion of capacities and change in the first part of *Θ*.

(*b*) How do points about the specification of a capacity deflect the objection that [C] and [A] are, as they stand, false? The reference at $1048^{a}20–1$ to the specification of a capacity directs attention back to $1047^{b}35–1048^{a}2$. But as noted (§5 above) there are two ways of understanding that earlier passage. The issue may be either that of specifying more closely the conditions under which a capacity is *possessed* (POSS), or that of specifying more closely the *content* of a capacity (CONT). Which of those two ways of understanding Aristotle's talk of the specification of a capacity gives the best gloss on $1048^{a}16–21$?

Suppose we take $1047^{b}35–1048^{a}2$ in terms of POSS. In that case the conditions to be mentioned are necessary conditions for the *possession* of the capacity. Those conditions are now said to include the absence of external preventative factors, and, if external preventative conditions *are* present, then the capacity will not be

possessed. In that case capacity possession would not be robust, but instead highly sensitive to external conditions. For example, a builder would lose his capacity to build if strong winds prevent him building a wall, and may gain it again as the winds subside (this approach would align with interpreting the preceding $1048^{a}15–16$ as a claim about capacity possession). Now, if the absence of external hindrances were a necessary condition for possession of a capacity, then the imagined counter-examples to [C] would indeed lapse. The antecedent of [C] would not be satisfied since the agent (for example, the builder) would not possess the capacity in question if external preventative factors were present. However, success in defending [C] is purchased at the cost of the implausible view that the absence of external hindrances to someone's ϕ-ing is a necessary condition for their possessing the capacity to ϕ. It does not seem that possession of the capacity to build should be any more sensitive to such external interference as wind and rain than it is to the absence or unsuitability of building materials (see §10 above).

Suppose then, on the other hand, that we understand $1047^{b}35–1048^{a}2$ in terms of CONT. In that case what needs to be added are qualifications to the *content* of a capacity; and the claim in the present passage will be that the absence of external hindrances should be included in the proper specification of the content of a capacity.

How would this deflect the alleged counter-examples to [A] and [C]? Suppose that, as recommended by CONT, the builder's capacity is more properly specified (in part) as a capacity to build-unless-strong-winds-are-blowing. Strong winds will not prevent *that* capacity being exercised. For conditions prevent the exercise of a capacity if it is not possible that any outcome which would be the appropriate exercise of the capacity should occur in those conditions. But what outome would be an appropriate exercise of the capacity to build-unless-strong-winds-are-blowing, in conditions in which strong winds *are* blowing? The answer is precisely: *nothing*. And there is nothing impossible in a builder's doing nothing when strong winds are blowing. So once the building capacity is properly specified we see that the blowing of strong winds does not prevent a builder exercising that capacity. So, given that the blowing of strong winds would not prevent an exercise of the building capacity, properly specified, it is not necessary to say that strong winds are *not* blowing in order to ensure that the builder will exercise the capacity he possesses (to build-unless-strong-winds-are-blowing) so long as

he chooses to exercise that capacity, and is appropriately related to suitable materials. That is, it will not be necessary to amend [C] to [C-ext]. The same point holds *mutatis mutandis* for [A] and [A-ext].

(*c*) But is the view of capacity content suggested by CONT any more appealing than the view of capacity possession suggested by POSS? Aristotle acknowledges that more qualifications will be built into the content of a capacity than the absence of external hindrances (note 'some of the things present' at $1048^{a}20–1$). But is it plausible even to claim that the qualification will include *at least* the absence of external hindrances?

Aristotle displays a concern elsewhere in his writings with the proper or canonical specification of capacities. At *Cael.* 1.11, $281^{a}7–26$, he says that certain capacities—such as the capacity to move or lift weights—are *properly* specified in terms of a maximum. Someone who lifts both 20 lb and 40 lb possesses the capacity to lift 40 lb, and that is the capacity he exercises in lifting 20 lb. Such judgements about the proper identification of capacities are not isolated intuitions about particular cases. There will invariably be general principles underlying our judgements, which can be extracted from intuitively obvious cases, and used to determine, or at least constrain, verdicts about capacity identification in cases which are less perspicuous. Aristotle's concern with questions about capacity identification, and the general principles that constrain capacity identification, is only to be expected, since it is a consequence of his wider metaphysical views. According to Aristotle there are many cases in which saying what something *is* is a matter of specifying certain capacities (for example, to be human is to have the capacity to . . . ; see *Meteor.* 4.12, esp $390^{a}17–19$, *PA* 1.1, $640^{b}29–641^{a}5$); and, given that, it is plainly important in such cases to get the identification of the capacities right.

The proper identification of capacities will be constrained by various general principles. Here is one which is both appealing in itself, and relevant to Aristotle's concerns at $1048^{a}16–21$ and $1048^{a}21–4$:

[GP] If A possesses the capacity to ϕ then (if there is some action ψ which would be an instance of ϕ-ing and it is not possible that A ψ, then that impossibility is due only to A's situation).

The general principle [GP] is intended to reflect an important feature of capacities: that I may possess a capacity to ϕ even though, given the situation I am in, it is not possible for me to exercise it (not possible for

me to ϕ). Aristotle has just reminded us of this point, if 1048ª15–16 is interpreted as recommended above (§10). For example, I possess the capacity to build, even though the absence of bricks renders it impossible for me to build (prevents me from building). But that feature of capacities needs to be handled cautiously. For establishing what it is possible or impossible for something to do does contribute in *some* way to correctly identifying its capacities: it does not seem possible that worms should discriminate colours, and that contributes to my assigning them one or another set of perceptual capacities. [GP] says something about *how* what it is possible or impossible for A to do should constrain the identification of A's capacities.

On the one hand, if the impossibility of A's doing something which would be an instance of ϕ-ing is due only to A's actual situation, then we should not adjust the identification of A's capacity accordingly. For example, how should we specify Candy's capacity vis-à-vis building? Building-a-log-cabin would be an instance of building; but there are no suitable logs around, so it is not possible that Candy-build-a-log-cabin—it is not just that she *is not* doing so, but the absence of logs *stops* her doing so (compare Commentary, Chapter 3, §9: the absence of logs would *explain* the impossibility of her building). But this impossibility, of Candy building a log cabin, is due to the situation Candy finds herself in (namely, there being no logs around), and obtains only given that she is in that actual situation. [GP] recommends that in that case we should not take the impossibility into account in refining the content of Candy's building-capacity. We should not say, for example, that strictly she possesses only a capacity to build-with-bricks.

On the other hand, if the impossibility of A's doing something which would be an instance of ϕ-ing is not due only to A's situation then we should take that into account in correctly specifying A's capacity. For example, Candy's capacity as regards building is not properly an *unqualified* capacity to build. For building-with-water would be an instance of building, and it is not possible that Candy build with water. Further that impossibility is not due to any particular situation that Candy finds herself in. However accommodating we are in applying the *Θ*3 test, it will deliver the verdict that it is not possible that she build with water: for assuming that she does so leads to contradiction, that the same stuff is fluid (it is water) and rigid (it stands upright and supports loads). So [GP] recommends that strictly we should refine the content of Candy's capacity: it is

a capacity to-build-with-materials-with-such-and-such-properties (compare Commentary, Chapter 1, §4 (*a*), (*b*), on the definition of active and passive capacities).

[GP] alone is insufficient to fix the canonical specification of capacities. But it supports two claims which Aristotle makes in this chapter. First, it suggests that the absence of external hindrances should be included in the proper specification of a capacity's content (1048^{a}20–1); second, it suggests that the proper specification of a two-way capacity should include some temporal qualification (1048^{a}22–3; see §12 below).

How does [GP] support the point about external hindrances? Strong winds prevent building. That is to say, building-in-strong-winds is impossible. Supposing that strong winds blow and walls are built leads to contradiction: since strong winds are winds that flatten walls, while building involves erecting walls, the same walls would be both flattened and erect. Further, the impossibility of building-in-strong-winds is not due to any particular agent's situation—building a log cabin is impossible for Candy only due to the fact that there are no logs present, whereas building in strong winds would be impossible no matter what her particular situation. So we should not say that the trained craftsman properly has the unqualified capacity to build. For building-in-strong-winds would be an instance of building, but building in strong winds is impossible for an agent independently of her particular situation. In contrast, [GP] does not rule out identifying a craftsman's skill as (in part) the capacity to build-unless-strong-winds-are-blowing. For building while strong winds are blowing would *not* be an instance of building-unless-strong-winds-are-blowing, and so it is irrelevant that the impossibility of an agent's building-while-strong-winds-are-blowing is not due only to that agent's situation (that it is impossible independently of the agent's situation). The same conclusion follows for any external hindrance we may think of. So according to [GP] the absence of external hindrances should be included in the proper specification of capacity content. And it then follows that we do not need to include a reference to the absence of external prevention in the antecedents of [A] and [C].

12. 1048^{a}21–4: A Final Objection

Recall the way in which the three main claims of *Θ*5 are related. First [A] is introduced; then it is shown that [A] fails for two-way

capacities (namely, [B] is established). As a result [A] is amended to [C]. Finally a possible objection to [A] and [C] is dealt with in $1048^{a}16–21$.

Now imagine an opponent who sought to extract a contradiction from [C] in much the same way that Aristotle himself generated a contradiction from the supposition that [A] should hold of two-way capacities. Such an opponent would hope to cause trouble for Aristotle in one of two ways: either by challenging the argument which Aristotle uses to establish [B] (in the light of §8 above, he may be successful in this); or by challenging [C] directly. The salient difference between [A] and [C] is that [C] adds a reference to the agent's *desires* and *choices*. Suppose, then, that Candy has a two-way capacity (for example, to heal and to harm), and *wants* to exercise it in both ways (she wants to heal her enemy, but she also wants to harm him). In that case it seems that [C] cannot be true. It is impossible that Candy actually *should* heal and harm the patient at the same time (compare $1048^{a}9–10$); but on the other hand it does seem possible that she should have both those desires at the same time (for example, she is torn between the desire to follow the call of duty and the desire for revenge). The present passage is intended to respond to that objection to [C]. How does it do so?

A first thought is that Aristotle already has the materials, earlier in this chapter, to dismiss this objection. For Aristotle does *not* say simply that someone will ϕ if he is in the right circumstances for ϕ-ing and desires to ϕ. He says rather that someone will ϕ if he is in the right circumstances and desires to ϕ *decisively* ($1048^{a}11–12$). And, while someone might, for example, both want to heal his patient and want to harm his patient, he could hardly want to do both *decisively* (he would precisely be an agent who had not decided which to do—compare *EN* 3.2, $1111^{b}20–3$: we can wish for, but not decide on, what is impossible). However, it would be wise for Aristotle not to repose too much weight on the notion of desiring one alternative rather than another *decisively*. For it is notoriously difficult to give any explanation of what it is to desire *decisively* to ϕ that is independent of desiring to ϕ and then ϕ-ing: what one desires to do decisively is simply what one does if one can. Indeed, the reason I have stated [C] in terms of an agent's choices, rather then her decisive desires, is in order to finesse this difficulty.

Aristotle's response builds instead on the preceding discussion in $1048^{a}16–21$ (hence the linking 'that is why' at $1048^{a}21$), and

proceeds by a more careful reflection on what the proper specification of the content of a rational capacity should be (1048ª22–3: 'it is not in this way that he has the capacity . . . nor is it a capacity . . .'). Recall the general principle [GP] from §11:

[GP] If A possesses the capacity to ϕ then (if there is some action ψ which would be an instance of ϕ-ing and it is not possible that A ψ, then that impossibility is due only to A's situation).

That principle delivers the result that the proper specification of (for example) the two-way capacity to heal and harm should include (at least) a temporal qualification: the capacity is properly a capacity to heal-and-harm-at-different-times. For suppose the content were specified just as a capacity to heal-and-harm. Healing-and-harming-at-the-same-time would be an instance of healing-and-harming. But healing-and-harming-at-the-same-time is impossible, and impossible independently of any agent's situation. So the rational capacity possessed by expert doctors is not most properly specified as a capacity to heal-and-harm. In contrast, a proper specification of that capacity as a capacity to heal-and-harm-at-different-times would not fall foul of [GP].

This is the point Aristotle summarizes at 1048ª22–3 ('for it is not in this way that he has the capacity for them, nor is it a capacity to do them at the same time'). Given that account of the proper specification of the content of rational capacities, Aristotle has a strong response to the objection envisaged, and one which avoids the complexities of *decisive* desire. The objection envisaged would pose a threat to [C] if and only if there were some capacity such that:

(i) Candy possesses that capacity.
(ii) Candy chooses to exercise that capacity.
(iii) Candy is in the right relation to a suitable patient to exercise that capacity.
(iv) Exercise of the capacity would involve doing opposed things at the same time.

The upshot of Aristotle's response is that there is no capacity which satisfies all of (i)–(iv).

First consider the rational capacity to heal-and-harm-at-different-times. There is no problem in allowing that Candy possesses *that* capacity, and so (i) holds of the capacity to heal-and-harm-at-different-times. So too, we can suppose, does (iii): Candy is

appropriately related to a suitable patient to exercise her (rational) capacity. But (ii) *does not* hold: Candy does not desire to heal and harm her enemy at different times (she rather both desires to heal him and desires to harm him). Nor does (iv) hold: exercise of the capacity to heal-and-harm-at-different-times would (on a single occasion) be either an instance of healing or an instance of harming.

Second, consider the capacity to heal-and-harm-at-the-same-time. It is true that (iv) holds of that capacity: exercising it *would* involve doing opposed things at the same time. But neither (i), (ii), nor (iii) holds. Candy does not possess that capacity (that follows from [GP], since exercise of the capacity is an impossibility independently of any agent's situation); Candy does not desire to exercise that capacity (she has opposed desires at the same time rather than a desire to perform some impossible action, healing-and-harming-her-enemy-at-the-same-time); and there is no relation to a suitable patient which would be appropriate for the exercise of that capacity.

Third, as noted above, [GP] rules out Candy's possession of the capacity to heal-and-harm-*simpliciter* (an unqualified capacity), on the grounds that this is not the proper specification of the rational capacity that is the medical art. So (i) fails to hold of that capacity.

Finally, consider these two capacities, each of which it seems Candy *does* desire to exercise: the capacity to heal, and the capacity to harm. Certainly, (ii) holds of each of those capacities. And we can suppose that (iii) holds: that Candy's relation to a suitable patient is appropriate for the exercise of each of those capacities. And (iv) would hold of the joint exercise of both capacities. But properly speaking (i) does not hold. Aristotle's claim in *Θ*2 was that a rational capacity is a *single* capacity for opposites ($1046^{b}4–5$: 'the very same capacity is a capacity for opposites'). There is no such rational capacity as the capacity simply to *heal* (although one is entitled to say that the single capacity which is for *two* outcomes is not indifferently related to them, and is *more properly* a capacity to heal than to harm; see Commentary, Chapter 2, §7).

So there is no capacity of which all of (i)–(iv) hold: and in that case the envisaged objection to [C] fails.

CHAPTER 6

1. An Overview of the Chapter

Aristotle now turns to applications of the potential–actual distinction which extend beyond those concerning change. He starts by rehearsing the connection between the earlier discussion of capacities and the investigation of these wider applications ($1048^a25–30$).

Two blocks of material follow, which are intended to elucidate these applications. In the first ($1048^a30–5$) there are three examples which illustrate something's being potentially (F); these should then clarify, by contrast, something's being actually (F). This material is particularly compressed.

The second passage ($1048^a35–1048^b9$) is more helpful. It introduces the idea that the general distinction between potentiality and actuality is best understood by recognizing the analogies between different applications ($1048^a35–7$, $1048^b4–9$). Aristotle provides five pairs of examples ($1048^a37–1048^b4$) in which these analogies are supposed to be apparent.

*Θ*6 closes with two passages whose sense, and relation to the chapter as a whole, are unclear. The first is the less perplexing: $1048^b9–17$ comprises brief comments on the status of the infinite and the void. The second ($1048^b18–35$) raises a number of difficulties. It explains an Aristotelian contrast, familiar from elsewhere in his work, between (*a*) changes which are incomplete and directed to a result beyond themselves (for example, house building), and (*b*) actualities which are complete at any and every point of their occurrence (for example, seeing). This distinction is intriguing but difficult in its own right. Further, the significance of this passage for the project of *Met. Θ* as a whole is extremely unclear. One reason for that unclarity is that the textual status of $1048^b18–35$ is disputed. The text is rather corrupt as it stands, is missing from many manuscripts of the *Metaphysics*, and may be a later insertion, either by Aristotle himself or by an editor.

2. $1048^a30–1048^b9$: Analogy and the Structure of *Metaphysics Θ*

Aristotle insists that the broad distinction between potentiality and actuality can be understood only by recognizing the analogies

between two main applications: the change–capacity relation and the substance–matter relation ($1048^{a}36–7$, $1048^{b}8–9$). The former was the focus of *Θ* 1–5, the latter is picked up from *Met. H*. The two applications are summarized at $1048^{b}8–9$: 'while the one is as change to potentiality the other is as substance to some sort of matter.' 'Potentiality' translates the noun *dunamis*, which was rendered 'capacity' in Chapters 1–5 in line with the policy adopted at Introduction, §3 (see further §4 below).

Analogy is an instance of the more general type *metaphor* (*Poetics* 21, $1457^{b}6–33$). Aristotle has an ambivalent attitude to metaphor (compare *Top.* 6.2, $139^{b}33–5$, with *Rhet.* 3.10, $1410^{b}9–20$, 31–6). Nevertheless he often appeals positively to analogies (this is a complex topic; Lloyd 1966 is a good place to start; for more on the relation between analogy and metaphor see Lloyd 1996: chs 7, 10). Aristotle uses analogies in many different contexts. They are very common in his biology; more than one-third of the occurrences of *analogous* and its cognates are in the biological works (see, for example, *HA* 1.1, $486^{b}17–21$; 3.2, $511^{b}5–7$; 3.16, $519^{b}27–8$; 8.2, $589^{b}18–19$; *PA* 1.4, $644^{a}21–3$, $644^{b}11$; *GA* 2.6, $743^{a}8–10$; 5.3, $782^{a}16–18$). Aristotle also appeals to analogy in discussing high-level general principles (*An. Post.* 1.10, $76^{a}37–41$, on principles which apply *analogously* in arithmetic and geometry), and very general notions of metaphysics. For example (*Phys.* 1.7, $191^{a}7–12$), we will understand the unfamiliar concept *underlying nature* if we recognize the analogies between a set of examples: as bronze stands to statue, and wood to bed, and the formless to what has a form, so underlying nature stands to substance. See also *Met. Λ*4–5 on the idea that form–matter–privation and actuality-potentiality apply *analogously* in the different categories.

Why does Aristotle think an appeal to analogy is necessary at *Met. Θ*6? The broad distinction between actuality and potentiality has to be explained by means of analogies because it would be a mistake to attempt a definition ($1048^{a}36–7$). Aristotle does not here expand on why this is, and commentators disagree on the issue. For example, Aquinas says that actuality and potentiality are *simple* notions, and that no simple notions can be defined (*Comm. in Met.* §1826). In contrast, Ross suggests that actuality and potentiality are *metaphysical* notions, and metaphysics deals with being in general, which is not a genus; whereas definition is by genus and differentia (Ross 1924: ii. 251).

Aristotle first offers three examples at $1048^{a}30–5$ (§3 below). Then he recommends attention to the analogies between a further five pairs of examples ($1048^{a}35–1048^{b}4$; see §4 below). By recognizing these analogies we can extract a general pattern, and characterize one side as actuality and the other as the potential ($1048^{b}4–6$). But Aristotle emphasizes that extracting a general pattern from the examples does not mean that there is a single concept which applies in the same way in each case ($1048^{b}6–7$). How does reference to analogy help us to balance recognition of a single pattern ($1048^{b}4–6$: actuality–potential), on the one hand, with sensitivity to the different senses of the terms ($1048^{b}6$: '*actually* is not in all cases said in the same way'), on the other?

Aristotle's gloss at $1048^{b}7–8$ suggests a mathematical notion of analogy: 'as this in this or to this, so that in that or to that' (compare the formula 'as A is to B so will C be to D' at *EN* 5.3, $1131^{a}29–1131^{b}17$; and Euclid, *Elements* V, definitions 5, 6, and VII, definition 20). That sort of analogy presents two items in a relation (A is to B), two further items in a relation (C is to D), and then a *second-order relation* between those relations (A is to B *as* C is to D). Now consider that second-order relation—which in the *Θ*6 appeal to analogy corresponds to the general actuality–potential contrast Aristotle is trying to explain ($1048^{b}6–8$: 'actually is not in all cases said in the same way, but ... *as* this in this ... *so* that in that'). There are two types of case, according as the second-order relation is (i) identity, or (ii) some other relation.

(i) In purely mathematical applications it is often the *same relation* which holds between A and B and between C and D. For example, 20 is to 10 *as* 50 is to 25 in that the very same relation (*being double*) holds between the first pair of items as between the second (compare *EN* 5.3, $1131^{a}31$: 'analogy/proportion is equality of ratios'). But that is not a good model for Aristotle's use of analogy in *Θ*6. If the *same relation* held between change and capacity and between substance and matter, then we would, presumably, have a *single* actuality–potential relation in all five examples at $1048^{a}37–1048^{b}4$.

But it is clear that Aristotle does not intend the examples to be understood in that way. Notice that Aristotle mentions both *induction* and *analogy* at $1048^{a}35–7$. Providing a series of cases in order to show that the *same relation* holds in each is an instance

of induction rather than analogy. This is a useful way to proceed when giving an account of a relation which is much clearer in some applications than others. For example, it is hard to see how the whole numbers are equinumerous with the odd numbers; so it helps to start from an easier application of the being-equinumerous-with relation. Each whole number can be paired with an odd number *just as* each cup on the table can be paired off with a saucer, and it is easy to see that the cups are equinumerous with the saucers. The explanation has the form of an analogy: the whole numbers stand to the odd number *as* the cups stand to the saucers. But, since it is the same relation which holds in the different cases, the explanation is more like providing easier examples in order to clarify harder cases. And using examples in that way is closer to Aristotle's notion of induction than to his notion of analogy. Aristotle's view of the connection between induction and examples is nuanced. He tends both to identify and to contrast them (identified at *An. Post.* 1.1, $71^{a}10$; *Rhet.* 1.2, $1356^{b}2$, $1356^{b}9$–10, $1357^{a}15$, $1357^{b}26$; *Rhet.* 2.20, $1393^{a}26$; contrasted at *Rhet.* 2.20, $1393^{a}27$–30, $1393^{b}8$–$1394^{a}9$). The main point is that argument by example is a limited form of induction, since in arguing by example we do not need to take in all the particular cases, nor to formulate a generalization explicitly (*An. Pr.* 2.24, $69^{a}16$–19).

Aristotle does use induction in *Θ*6 ($1048^{a}35$–6: things will become clear 'from the particular cases by induction'). Of the five examples at $1048^{a}37$–$1048^{b}4$, the first three illustrate one relation (change–capacity), and the last two another (substance–matter). The further appeal to analogy is required precisely because the second-order relation between change–capacity and substance–matter relations is *not* identity ($1048^{b}6$–9: we do not use *actually* in the same way in the change–capacity and substance–matter cases).

(ii) When the second-order relation is not identity there is not the *same* relation holding between all the analogates. In such cases analogy does not shade into the elucidation of difficult applications by means of easier examples. At *Met.* *Λ*4, $1070^{b}10$–29, Aristotle says that different classes of thing have principles which are only analogically the same; we can give a general statement of these principles—form, privation, and matter; but that triad is instantiated in *one* way in the case of colours (white, black, surface) and in a

distinct way in the case of buildings (structure, disorder, bricks). At *Met.* Λ5, 1071^{a}3–17, he makes the same point about actuality and potentiality, which apply to different types of thing in different ways. The five examples at *Met.* Θ6, 1048^{a}37–1048^{b}4, are to be understood in a similar way. We can introduce a pair of terms for the general dichotomy: actuality and the potential (1048^{b}4–6). But that dichotomy is instantiated in *one* way in the capacity–change relation, and in *another* way in the substance–matter relation.

Some terminology will help to mark the distinction. The general actuality–potentiality pattern is a *schema*, instantiated in different *relations*: change–capacity and substance–matter. Similarly at *Met.* Λ4–5: form–privation–matter is a common schema instantiated in different ways in the white–black–surface relation and the structure–disorder–bricks relation. Contrast (i) above: being-double is *not* a schema instantiated in one way in the 20–10 relation, and in another way in the 50–25 relation. It is a single relation holding between 20 and 10, on the one hand, and 50 and 25, on the other. It will be extremely difficult to say in general what fixes whether we have a single relation applying in different cases, or different relations instantiating a common schema. But the distinction at issue seems obviously to be a genuine one. For example, it seems plain that *is father of* does not designate the same relation between Charles and William, between the first person of the Trinity and Christ, and between God and mankind.

The emphasis in Θ6 on analogy shows something about the overall structure of *Met.* Θ. It is plain that there is a transition at Θ6 from the discussion of capacities and change, which were the focus of Θ1–5 (1048^{a}25–30). Getting clear on the overall structure of Θ is largely a matter of understanding the precise nature of that transition. The important point is that Θ6 is not a 'horizontal' move, from a discussion of one relation (change–capacity) 'sideways' to discussion of another (substance–matter). It is rather a 'vertical' move, from discussion of the change–capacity relation 'upwards' to consideration of the more general schema: actual–potential being. Of course, a consequence of making that vertical move is that the wider perspective thereby attained now takes in another relation, substance–matter; and so, in that respect, Θ6 does start an examination of substance and matter. (At Θ8, 1050^{b}6–1051^{a}2, a third case will be brought within the wider perspective: the relation between

eternal and perishable things.) But moving to a wider perspective on the change–capacity relation is something quite different from turning attention away from that relation entirely.

So Aristotle's appeal to analogy at $1048^{a}30$–$1048^{b}9$ lends support to the Frede interpretation of *Met. Θ*, as opposed to the Ross interpretation (see Introduction, §1, and then Commentary, Chapter 1, §2). The core of the Frede interpretation is that the discussion of change and capacity in *Θ*1–5 is already a discussion of actual and potential being, rather than simply a preparation for that discussion. *Θ*6 explains *how* that is so: change–capacity is one instance of a general schema which is identified by drawing attention to the analogies between different cases.

Of course, it is significant that the 'vertical' move at *Θ*6 does bring the substance–matter relation into view, as an instance of the general actual–potential schema. One outcome of *Met. Θ* will be an endorsement of the claim made in *Met. H6* that the form–matter dichotomy can be understood by reference to actuality-potentiality (Introduction, §6). From this point on in *Met. Θ* Aristotle's main concern is the general actual–potential schema. *Θ*7 provides an account of the conditions under which something is potentially F which relies on the interconnections between change–capacity, on the one hand, and substance–matter, on the other ($1048^{b}37$–$1049^{a}18$). And an important result of *Θ*8 is the general claim that actuality is prior in substance to potentiality ($1049^{b}5$–11, $1051^{a}2$–3, emphasize the generality of the claim). At the same time, the general perspective gained by seeing change–capacity, substance–matter, and eternal–perishable as instantiations of a common schema—actual and potential being—casts light on the particular cases. For example, it is easier to understand the relation of form and matter once we see that form (as an instance of actual being) is prior in substance to matter (as an instance of potential being).

It is difficult to state clearly the dialectical relation between the higher schematic level (actuality–potentiality) and the lower level cases (change–capacity, substance–matter, eternal–perishable). Considerable complexities are involved when we generalize over cases on the basis of analogies. For there are significant differences between the relations of change to capacity, substance to matter, and eternal thing to perishable thing. And those differences may be unsystematic. That is why the different relations are brought under a common pattern only through analogies (rather

than by a focal account, such as that provided for capacities at *Θ*1, 1046^{a}9–19: compare *EN* 1.6, 1096^{b}26–8, for analogy and focal accounts as alternatives). The analogical perspective is valuable because it can elucidate difficult particular cases, and suggest fruitful ways of thinking. But caution is required when establishing a conclusion concerning the schematic level, in view of the significant differences between analogates. It should, at the very least, be possible to check that the conclusion applies at the schematic level by establishing it case by case for each particular instance of the schema. For example, in establishing the general conclusion in *Θ*8 that actuality is prior in substance to potentiality, Aristotle argues case by case for the different relations covered by the potentiality–actuality schema (1050^{a}4–10: immature to mature specimens of a kind; 1050^{a}10–14: capacity possession to capacity exercise; 1050^{a}15–23: pre-existing matter to substance; 1050^{a}23–1050^{b}2: capacity to exercise; 1050^{b}6–1051^{a}2: perishable things to eternal things). It should not be surprising that Aristotle proceeds in that way. If those cases can be unified only by analogy, then there is no *single relation* which holds in each case, so there is not really a single relation about which a conclusion can be established. The difficulty lies in balancing the diversity of the different cases with the genuine analogies between them, and according both diversity and unity their due weight in establishing general conclusions (see Frede's introductory essay in Frede and Charles 2000, for a discussion of these difficulties in connection with Aristotle's appeal to analogy in *Met. Λ*4–5).

A related point. There are also differences among the three cases which I said illustrate the change–capacity relation (1048^{a}37–1048^{b}2). For example, in terms of the distinction at *Θ*6, 1048^{b}18–35, building is a change (directed to a result outside itself), seeing is an actuality (not directed to a distinct result). But it would be wrong to suppose that these three cases too are unified only by analogy. Aristotle established conclusions about capacities in *Θ*1–5. He worked there with an undifferentiated notion of change, and did not argue case by case (for incomplete changes, for complete actualities). For example, *Θ*2, 5, mention both medical skill (*Θ*2, 1046^{b}6–7) and the senses (*Θ*5, 1147^{b}31–2); nothing is made of the point that an exercise of the first (healing) would be an incomplete change directed to a result (a healthy patient), while exercise of the second (seeing) would be complete in itself. The arguments at *Θ*5,

$1047^{b}35–1048^{a}24$, include no examples at all; so the conclusions concerning capacities and their exercise will not be sensitive to the more fine-grained distinction between incomplete changes and complete actualities. It is reasonable to talk of a single change–capacity relation in the three examples at *Θ*6, $1048^{a}37–1048^{b}2$, because the relation is treated as a single relation throughout the arguments of *Θ*1–5. And it is reasonable to talk of a single substance–matter relation in the two examples at *Θ*6, $1048^{b}2–4$, even though there is a difference between immediate and mediate matter (see §4 below), because that difference does not show up in the arguments concerning matter at *Θ*7–8. In contrast, it is not reasonable to talk of a single actuality–potentiality relation which covers all the cases, because the change–capacity/substance–matter difference does show up, for example, in the arguments of *Θ*8. To repeat: it is rather that the actuality–potentiality dichotomy is a general schema, instantiated analogically in two different relations.

3. $1048^{a}30–5$: The First Set of Examples

Aristotle's explanation of the actuality–potentiality distinction falls into two parts ($1048^{a}30–5$, $1048^{a}37–1048^{b}9$), separated by the reference to induction and analogy at $1048^{a}35–7$. Commentators typically concentrate on the second part, and the five examples provided at $1048^{a}37–1048^{b}4$, where the analogical structure is clearer. The first part, in contrast, is extremely compressed. But we should not simply pass over $1048^{a}30–5$ as an attempt which fails where $1048^{a}37–1048^{b}9$ succeeds. Aristotle was presumably perfectly capable of dropping passages which do not achieve their purpose. So it is more likely that $1048^{a}30–5$ plays a role in the overall argument. What could that role be?

The passage $1048^{a}30–5$ motivates the appeal to analogy at $1048^{a}35–7$, because the fact that it is not a very helpful explanation reveals the limitations of one way of approaching the general actuality–potentiality distinction. Aristotle's remark at $1048^{a}30–2$ has the flavour of a definition: *actuality* is something's existing or obtaining, but not *potentially*. As it stands that will not explain much, because the adverb *potentially* (the dative *dunamei*) barely featured in *Θ*1–5. Those chapters concentrated almost entirely on the noun *capacity* (the nominative case of the same Greek word *dunamis*: recall Introduction, §3), and the adverb *potentially* becomes important only in the second part of *Θ*—for example, in the discussion at

*Θ*7, 1048^{b}37–1049^{a}18, of the conditions under which something is potentially F. It is striking that the adverbial dative *dunamei* occurs only three times in Chapters 1–5 (at *Θ*1, 1046^{a}30, *Θ*2, 1046^{b}25, and *Θ*3, 1047^{b}1); but twenty-three times in Chapters 6–9. But it is clear why Aristotle has to draw the contrast he does at 1048^{a}30–2. It would not be sensible for him to explain *actuality* at the start of *Θ*6 by contrast with the nominative *dunamis*. For there would then be pressure to understand *dunamis* in the light of *Θ*1–5 as *capacity*, as connected with change, and that would not help Aristotle to get at the broader notions of actuality and potentiality which are his concern in *Θ*6.

So Aristotle provides three examples to illustrate the notion which now carries explanatory weight—*potentially* (1048^{a}32–5):

(i) Hermes in the wood;
(ii) the half line in the whole;
(iii) someone not contemplating, but capable of contemplating, is a knower.

First, the examples themselves. All three occur, along with others, in a shorter note at *Met.* *Δ*7, 1017^{a}35–1017^{b}9, on the distinction between what is potentially and what is in fulfilment (Aristotle there uses the term *entelecheia*: recall Introduction, §4). It is not obvious how they form a homogeneous group. Examples (i) and (ii) are easier. They exhibit a common structure: there are two items A (Hermes, half line) and B (wood, whole line); A is in B, and A could be separated out from B. Examples (i) and (ii) fulfil the promise of 1048^{a}32, by explaining what is meant by saying that Hermes and the half line are potentially: each could be separated out from what it is in (I could carve the wood and produce a Hermes, I could divide the whole line and produce a half line).

But (iii) is harder to understand. It does not have the same structure, and does not use the 'in' locution of (i) and (ii). Comparison with *Met.* *Δ*7 (1017^{b}3–5) suggests that the two items introduced by (iii) are someone capable of contemplating and someone actually contemplating. The point of (iii) is then presumably that the former is potentially a knower (1048^{a}34), and the latter actually a knower (compare *An.* 2.5, 417^{a}22–30). It is noteworthy that (iii) is also separated from (i) and (ii) in the *Met.* *Δ*7 passage: (i) and (ii) are there given as examples concerning substances (1017^{b}6), as distinct from (iii).

The reference to the contrast *actually* at 1048ª35 could hardly be more compressed, and no examples are provided of that side of the distinction.

There are two reasons why 1048ª30–5 is not a very helpful explanation of the broad actuality–potentiality contrast. First, it fails to clarify both sides of the contrast together, and second it does not build sufficiently on the material in *Θ*1–5. The appeal to analogy which follows at 1048ª35–1048ᵇ9 repairs both those faults. Whereas 1048ª30–2 refers to a contrast, but offers no examples, and 1048ª32–5 offers examples for only one side of the contrast, the later examples at 1048ª37–1048ᵇ4 specify both sides of the distinction far more fully. Further, the later examples are better integrated with the *Θ*1–5 discussion. They provide three pairs of cases framed in terms of the change–capacity relation which was the focus of *Θ*1–5 (1048ª37–1048ᵇ2); two pairs are added which concern the substance–matter relation (1048ᵇ2–4); the general potentiality–actuality schema is then explained by pointing to the analogies between the two relations.

4. 1048ª35–1048ᵇ9: The Second Set of Examples

There are five pairs of examples at 1048ª37–1048ᵇ4:

(*a*) what builds	what can build
(*b*) what is awake	what is asleep
(*c*) what is seeing	what has closed eyes but has sight
(*d*) what has been separated off from the matter	the matter
(*e*) what has been finished off	what is unwrought

I take these as dividing into two groups, and I have provided '[so is]' as a supplement at 1048ᵇ2 to mark that structure. Examples (*a*)–(*c*) illustrate the change–capacity relation; (*d*)–(*e*) the substance–matter relation; Aristotle's intention is to clarify the general actuality–potentiality schema which both relations instantiate. More detailed comment follows.

First, examples (*a*)–(*c*). The six items mentioned in (*a*)–(*c*) are not in fact either capacities or changes. On the right-hand side we have descriptions of objects characterized as possessing a certain capacity or set of capacities (*Met. Θ*3, 1046ᵇ34–5, on building; *An.* 2.1, 412ª23–6, on being asleep; *Met. Θ*5, 1047ᵇ31–2, on sight).

And, on the left-hand side, we have the same items characterized as exercising the capacity: someone building exercises her capacity to build, someone awake exercises certain capacities, and someone seeing exercises her sight. It might be objected that, had Aristotle wanted to make a point about the relation between a change and a capacity, then he could easily have replaced (*a*), for instance, by 'building a house, the ability to build a house'. So are (*a*)–(*c*) really intended as examples of the change–capacity relation?

Aristotle's summary of the analogy at 1048^{b}8–9 suggests that they are: some are as change in relation to capacity, some as substance in relation to matter (but recall §2 above on the translation 'potentiality' at 1048^{b}8). Examples (*d*) and (*e*) plainly qualify as substance to matter. And that suggests that (*a*)–(*c*) illustrate the change–capacity relation. Further, it is entirely understandable that (*a*)–(*c*) should be stated in terms of objects possessing and exercising capacities. For capacities and the changes which result when they are exercised do not 'float free'. There are no capacities which are not possessed by some object, and there are no changes which do not consist in some object changing (*Phys.* 3.1, 200^{b}32–201^{a}3). So any claim about the capacity–change relation will bring in its train a parallel claim about objects possessing and exercising capacities. The position was the same as regards the claims established in earlier chapters. *Met. Θ*2 distinguished two types of *capacity* (the subject of 1046^{a}36–1046^{b}7 is *origins of change*; and the distinct correlative point about agents possessing different types of capacity is made separately at 1046^{b}15–24: see Commentary, Chapter 2, §8). But the main results of *Θ*5, concerning the exercise of these capacities in the right conditions, have to be stated in terms of agents and patients (1048^{a}5–7, 11–15). The reason again is that (active) capacities are possessed by agents, and the changes to which they give rise occur in patients.

Examples (*a*)–(*c*) do not suggest any special concern with the 1048^{a}18–35 distinction between incomplete changes and complete actualities: building falls on one side, seeing on the other side, of that distinction (recall §2 above). But the examples are carefully chosen in another respect. The capacities involved in each case (the capacity to build, the capacities possessed by a sleeper and exercised on waking, the capacity to see) exhibit a common feature: they are capacities which are not lost in the course of being exercised (unlike, for example, the capacity of wood to be burned or the capacity of

a child to learn French). That common feature will be significant as regards the analogies between the change–capacity and substance–matter relations (for Aristotle's discussion of this difference between capacities see *An.* 2.5, 417^{a}21–417^{b}6; for initial comment on the feature, see §7 below; for discussion of its significance see Commentary, Chapter 7, §7 [iii]).

Second, examples (*d*)–(*e*). They illustrate the matter–substance relation (1048^{b}9). Aristotle's concept of *matter* is a broad one. The core notion is that the matter of something is *what composes it*. In contrast, the form of something is that in virtue of which the composing matter *does* compose it. The statue is composed of bronze, and the bronze composes a statue in virtue of its shape. The core notion of composition is suggested by Aristotle's common characterization of matter as a substratum, something which *underlies* (*Phys.* 1.9, 192^{a}31–2; *GC* 1.4, 320^{a}2; *Met.* A3, 983^{a}30; *H*2, 1042^{b}9–10; *Λ*3, 1070^{a}11): the matter which composes a statue is plausibly the underlying subject for the properties being-a-statue, being-large, being-in-the-temple, and so on. Matter functions as a persisting substratum in Aristotle's account of change: some matter first of all lacks a form and then acquires it (*Phys.* 1.7). The notion of something's matter as what composes it also extends well to less central applications: it is fairly natural to speak of statues as composed of bronze, words as composed of letters, arguments as composed of premisses, definitions as composed of their defining terms, and sets as composed of their members (see Fine 1992).

There are two important distinctions which will help us understand what Aristotle has to say about the matter which composes something:

(i) The *pre-existing* matter of an F exists before the F which it comes to compose (for example, the bronze existed before it was shaped into a statue); the *concurrent* matter of an F exists for only as long as the F which it composes. It is hard to provide uncontroversial examples of concurrent matter: perhaps the baked egg whites which exist for only as long as the meringue they compose. It may be that Aristotle holds that flesh and bone are concurrent matter of human beings.

(ii) The *immediate* matter of an F is the highest level matter of which the F is composed (for example, the bronze composes the statue immediately); the *mediate* matter of an F composes

the F in virtue of composing something else which composes (something else, which composes, and so on) the F (for example, copper and tin compose the statue in virtue of composing bronze, which in turn composes the statue).

These distinctions are independent. Pre-existing matter may be immediate (the bronze is pre-existing matter for the statue) or mediate (the copper and tin are pre-existing matter for the statue). Similarly, concurrent matter may be immediate (perhaps the flesh from which this animal is composed) or mediate (the cells which compose the flesh and thereby compose the animal).

Examples (*d*) and (*e*) would cover both pre-existing and concurrent matter. The right-hand side of (*e*)—what is unwrought—refers unambiguously to pre-existing matter; the right-hand side of (*d*) would include both pre-existing and concurrent matter. The examples are indeterminate as regards immediate and mediate matter, presumably covering both.

5. $1048^{b}9$–17: The Infinite and the Void

This passage is peripheral to the main argument of *Θ*6. I will not comment at great length. Aristotle's general point is clear enough, although details are obscure.

The strategy of $1048^{a}35$–$1048^{b}9$ was to explain both sides of the potentiality–actuality schema together. Examples (*a*)–(*e*) at $1048^{a}37$–$1048^{b}4$ suggest a minimal pattern: given some item characterized as potential, there will be some correlative item to be characterized as actual—corresponding to someone asleep, there is someone awake; corresponding to something unwrought, there is something finished off. But there are cases which do not seem to fit even this minimal pattern. For example, according to Aristotle the number of divisions of which a continuous line admits is potentially infinite: if that were not the case, an unacceptable atomist conclusion, that there are indivisible magnitudes, would follow. However, Aristotle also holds that a continuous line does not admit of an actually infinite number of divisions (see *Phys.* 3.6 on the infinite in general, and *GC* 1.2, $315^{a}24$–$316^{b}34$ on infinite divisibility). Aristotle's aim in the present passage is to accommodate such cases. (He concentrates on the case of the infinite. His point about the void may be that, while there is no interval which is actually empty, it is possible, given a medium of any degree of density, to

rarefy it further—see Burnyeat 1984 and Ross 1924: ii. 252. But at *Phys.* 4.9, 217^{b}20–1, he explicitly denies that there is potentially a void.)

Details are obscure because the way in which Aristotle accommodates the case of the infinite is unclear. I have adopted a textual emendation, suggested by Burnyeat, according to which Aristotle's point here is that the division of a line is infinite in that it is endlessly coming about—given any finite number of divisions I can keep on dividing; but it can never be the case that an infinite division has come about. This parallels *Phys.* 3.6, 206^{a}18–25, and fits with the reference at 1048^{b}15–16 to a division's not coming to an end. According to the reading of Ross and Jaeger, Aristotle's point at 1048^{b}15 would be that the infinite is potentially 'in knowledge'. Maybe a reference to knowledge could just about be fitted into Aristotle's account of infinite divisibility (I *know* that no matter how many divisions of the line I have made, I can always make another)—but doing so does not explain very much about the Aristotelian position, nor fit very naturally with *Phys.* 3.6. But I will not discuss this further (see Hussey 1983 for detailed comment on *Phys.* 3.6).

6. 1048^{b}18–35: Changes and Actualities

This passage explains a distinction more fine-grained than any Aristotle has worked with so far in *Met. Θ*. In this section I comment on the content of the passage; in the following section on its textual status and contribution to the overall project of *Met. Θ*.

The discussion has three components:

[M] The distinction is drawn metaphysically, in terms of two types of structure for actions (1048^{b}18–23, 26–7).
[L] A linguistic marker of the distinction, concerning the present and perfect verb forms (1048^{b}23–6, 30–4).
[E] Examples of the distinction (1048^{b}29–34).

At 1048^{b}28 and 35 Aristotle provides some terminology for the distinction: 'change' (*kinêsis*) and 'actuality' (*energeia*). Both of these terms are already playing central roles in *Met. Θ*. In the following section I will comment on the relation between those terms as used within 1048^{b}18–35 and as used in the rest of the book. That issue is connected with the place of this passage within *Met. Θ* as a whole. In this section I will underline change and actuality

to represent the terminology as Aristotle uses it within $1046^{b}18–35$; for the present I say nothing about the relation between change and change, and between actuality and actuality (that is, between the distinction drawn within $1048^{b}18–35$ and the terminology used elsewhere in *Met. Θ*: see further §7 below).

[M] We start with a very general notion of action ($1048^{b}18$)—what, in the very broadest sense, can be *done*.

In some cases an action leads to a distinct result, something over and above the action itself (*Met. Θ*8, $1050^{a}25–7$, 30–1). Sometimes this will be a quasi-substantial persisting product, which may continue with a history of its own: for example, Candy's house building results in a house. Sometimes it will be a new property of the agent: Candy's being cured results in her health, Candy's walking results in her being in a new place. The action is a transition between termini: from a starting point (the bricks and wood; Candy being ill) to a resultant point (a house; Candy being healthy). The action considered in itself is incomplete, and is completed by the result to which it is a transition. We can sensibly ask whether Candy's house building is finished, and the answer is fixed by whether the house in which it results exists. Aristotle calls these incomplete actions changes ($1048^{b}28$, 35).

In other cases, when an agent performs an action, the action is all there is to it, and there is no result distinct from the action itself. As Aristotle puts it at *Met. Θ*8, $1050^{a}23–5$, 34–5, it is the exercise which is final. For example, Candy's living, seeing, or understanding mathematics do not result in distinct states or conditions: Candy's life just *is* her living, her living just *is* her life. The actions are complete considered in themselves. It would not make sense to ask whether Candy has *finished* living, seeing, or understanding the theorem (as opposed to *having stopped* doing those things). The reason is that there is no additional result to which the actions are directed, and which is required for them to be completed. Aristotle calls these complete actions actualities ($1048^{b}28$, 34–5).

The distinction is also found outside the present passage. It is central to the discussion of pleasure at *EN* 10.3–5, there is a passing reference at *Sens.* 6, $446^{b}2–5$, and a related distinction concerning ends at *EN* 1.1, $1094^{a}3–6$. *Top.* 6.8, $146^{b}13–19$, suggests that at one time Aristotle was not clear on the significance of the distinction.

[L] Aristotle concentrates on just one linguistic marker of the distinction at $1048^{b}23–6$, 30–4: the relation between present (A is ϕ-ing) and perfect (A has ϕ-ed) verb forms. The phrase *for example* at $1048^{b}23$ suggests that this is one mark among others (compare *EN* 10.3, $1173^{a}32–1173^{b}4$; 10.4, $1174^{b}7–9$: for example, whether it is appropriate to say that someone is *further on* with ϕ-ing, that ϕ-ing *takes a long time*, that someone is ϕ-ing *quickly* or *slowly*).

Aristotle says that:

(*a*) In the case of actualities present and perfect apply *at the same time* ($1048^{b}23$, 25, 33)

while

(*b*) In the case of changes present and perfect apply *not at the same time* ($1048^{b}30$), and are *different* ($1048^{b}32–3$).

Claim (*a*) could be taken as the weaker claim that present and perfect are compatible, or as the stronger claim that the present entails the perfect. The parallel passage at *Sens.* 6, $446^{b}2–5$, suggests that (*a*) is the stronger claim that, in the case of actualities, the present entails the perfect (see Ackrill 1956: esp 123–4; for the weaker reading, see Waterlow 1982*a*: 183–6).

Now compatibility is a symmetrical relation, so, if we had taken (*a*) as a weaker claim of compatibility, it would follow that Aristotle intended a relation which held between present and perfect and vice versa. But entailment is not symmetrical. So there are now two options open: either that (*a*) is the claim that in the case of actualities the present entails the perfect but not vice versa, or that (*a*) is the claim that in the case of actualities the present entails the perfect and the perfect entails the present. Neither option is mandated by the decision to interpret (*a*) as a stronger claim about entailment. Notice though that the relations mentioned by Aristotle in (*a*) and (*b*)—*(not)-at-the-same-time* and *different*—are all symmetrical. And further, while the present verb form precedes the perfect in almost all the examples Aristotle gives, in one instance that order is reversed ($1048^{b}33$: 'has seen and is seeing'). That suggests that we should interpret (*a*) as the claim that in the case of actualities present and perfect entail one another: A is ϕ-ing if and only if A has ϕ-ed (see Burnyeat, forthcoming).

By contrast, the claim in (*b*) in the case of changes present and perfect is incompatible with one another: if A is ϕ-ing then it is not the case that A has ϕ-ed, and if A has ϕ-ed then it is not the case that A is ϕ-ing.

It is not easy to see precisely what the present–perfect marker comes to. A good way into Aristotle's point is to consider some of the star examples Aristotle gives of changes and actualities. It is obviously important that the present–perfect test should deliver verdicts in line with these star examples.

[E] Aristotle gives examples of both actualities and changes at $1048^{b}29–34$. They are an interesting range of cases. Some of the examples of actualities suggest that the distinction would be of importance for ethics (living well, flourishing, living ($1048^{b}25–7$): compare the point at *Met. Θ*8, $1050^{a}30–1050^{b}2$, that flourishing is located in the soul). *Thinking* occurs twice as an example of an actuality ($1048^{b}24$, 34): so the point that actualities have no intrinsic limit and could go on endlessly ($1048^{b}26–7$) will be important for the account of the eternally thinking first mover in *Metaphysics Λ*6–9. Interestingly *pleasure*, the subject of *EN* 10.3–5, does not occur as an example of an actuality. Particular examples of changes include some which result in quasi-substantial products (house building ($1048^{b}29–30$, 31); compare *Met. Θ*8, $1050^{a}26–7$, 28–9, 31–2; *EN* 10.4, $1174^{a}19–21$) and some which result in altered states (making thin ($1048^{b}19$), learning ($1048^{b}29$)); there are also some very general examples (coming to be, being changed ($1048^{b}32$)).

A star example of a change is walking ($1048^{b}29$, 30–1; compare *EN* 10.4, $1174^{a}29$). But it has been objected that, according to the present–perfect test, walking should *not* count as a change (see especially Ackrill 1965). It is often true, for example, as she patrols the grounds, both that Candy is walking and that Candy has walked. And this is not an isolated example. The dye is colouring and has coloured my pullover; the ice cubes are cooling and have cooled my drink.

Aristotle has a reply available. He could say that the changes in question need to be identified more accurately, in particular by specifying their starting and finishing points. Walking from A to B and walking from C to D are different changes; so too colouring my pullover from white to pink, and colouring my pullover from pink to red. And when candidate changes are identified more accurately, the

present–perfect test delivers the right verdicts. If Candy *is* walking from the kitchen to the garden gate, then it is not the case that she *has* walked from the kitchen to the garden gate; perhaps she *has* walked from the kitchen to the front door, but then its not the case that she *is* walking from the kitchen to the front door. Likewise *mutatis mutandis* for the other cases.

Aristotle does make this move at *EN* 10.4, $1174^{a}29$–$1174^{b}9$; and *Phys.* 6.1, $231^{b}28$–$232^{a}1$, explicitly mentions destinations in a statement of present–perfect incompatibility (a man cannot at the same time be walking *to Thebes* and have walked *to Thebes*). Further, it is not an ad hoc move, but a natural consequence of the metaphysics underlying the change–actuality distinction. Since a change is precisely a transition from a starting point to a final point, then identifying a change should involve specifying those points. And the specification of termini features in Aristotle's account of the identity and individuation of changes at *Phys.* 5.4 (in particular $227^{b}20$–9). Is this a good response for an Aristotelian to make? At this point the counter-argument may develop in two directions.

One counter-objection, offered by Ackrill, is that, if changes are to be properly identified by reference to their termini, then actualities too can be more accurately identified—namely, by reference to their *objects*. It is one thing to see the tennis match, another to see the first set; one thing to enjoy the meal, another to enjoy the main course. And in that case, the present–perfect test will deliver the wrong verdict on a star example of an actuality such as seeing. As the first set ends, I am seeing the tennis match; but it does not follow that I have seen the match—if I then drop dead I precisely *will not* have seen the match. (Even intransitive actualities might be more finely specified: perhaps there is a difference between living my adolescence well, living well so far, and living a whole life well.) The Aristotelian could respond to Ackrill by challenging the parallel between the relation of a change to its termini and that of an actuality to its object (see Penner 1970: esp. 411–24). Alternatively, the Aristotelian could respond by arguing that, even when an actuality does have a change as its object, still the actuality does not inherit the temporal structure of the change (see Kosman 1984: esp. 126 n. 11). For example, learning should count as a change:

(i) I am learning the Sanskrit alphabet

and

(ii) I have learned the Sanskrit alphabet

are incompatible. Enjoying should count as an actuality, and it may be that *what* I enjoy is a change such as learning the Sanskrit alphabet. But it does not follow from (i) and (ii)'s being incompatible that

(i*a*) I am enjoying learning the Sanskrit alphabet

and

(i*b*) I have enjoyed learning the Sanskrit alphabet

are incompatible. On the contrary, far from inheriting the incompatibility of (i) and (ii), (i*a*) and (i*b*) could entail one another. That is because, while (ii) implies that my learning (the change) is complete, (i*b*) implies no such thing—I could assert (i*b*) while taking a break in my study, without suggesting that I have mastered the whole alphabet. Further, (i*b*)—which says that the object of my enjoyment (actuality) is the (change) learning—is to be distinguished from

(ii*a*) I am enjoying having learned the Sanskrit alphabet

and

(ii*b*) I have enjoyed having learned the Sanskrit alphabet

which say that the object of my enjoyment (actuality) is the result, that is, having-learned; and (ii*a*) and (ii*b*) can also imply one another.

An alternative, and potentially more damaging, counter-objection to Aristotle's response is that his reliance on the view that changes are identified by their termini leads to disastrous consequences elsewhere. Since a change involves a transition between termini, every change must take time (*Phys.* 5.4, $227^{b}26$: many actualities in fact occupy time as well—for example, living and flourishing—but that is not a necessary consequence of the metaphysical structure of an actuality; this may be Aristotle's point at the difficult *EN* 10.4, $1174^{b}7$–9). Time is continuous, and a change which occupies a period of time will be divisible in the same way that the time is (*Phys.* 6.1–2). If Candy walks from A to B steadily in an hour, then she will be halfway between A and B after half an hour, three-quarters

the way to B after 45 minutes, and so on. At *Phys.* 6.6 Aristotle draws the obvious consequence: if something is changing, then it has already completed an infinite number of changes (*Phys.* 6.6, $237^{a}9–11, 15–16$). For example, if Candy is walking, she has already taken some time doing so and covered some distance; the distance already covered is infinitely divisible; so, if walkings are identified by their termini, then she has already performed an infinite number of distinct walks. (Aristotle also appeals to the *Phys.* 6.6 view at *Met.* *Θ*8, $1049^{b}35–1050^{a}2$, in replying to a sophistical argument about capacity acquisition; see Commentary, Chapter 8, §5.)

However, the *Phys.* 6.6 consequence in fact threatens to undermine the view of change which is central to *Metaphysics* *Θ* (see Waterlow 1982*a*: ch. 3, pp. 131–58 on the tension between *Phys.* 6 and the metaphysical account of change in *Phys.* 3, and the role of *Phys.* 8 in the resolution of that tension; also White 1992: ch. 2, pp. 102–15). Notice first that the *Phys.* 6.6 consequence is very general: it follows simply from views about the structure of time (*Phys.* 6.6, $237^{a}8–11, 15–16, 25–8, 237^{b}7–9, 20–1$): so, given Aristotle's views about the structure of time, then, for any action ϕ which takes place in time *and* which is individuated by its termini, it will follow that, if A is ϕ-ing, then A has already completed an infinite number of ϕ-ings. Now, according to *Metaphysics* *Θ* a capacity is one type of origin of change (*Θ*1, $1046^{a}9–11$; *Θ*8, $1049^{b}5–10$); a change stands to the capacity which is its origin as actuality to potentiality (*Θ*6, $1048^{b}4–9$); and particular capacities are to be defined by reference to the changes which are their exercise (*Θ*8, $1049^{b}12–17$: actuality is prior to potentiality in account; see Commentary, Chapter 8, §3). But this *Met.* *Θ* view of the change–capacity relation does not sit well with *Phys.* 6.6: together they lead to the unacceptable consequence that any change in A involves A's possessing an infinite number of distinct capacities. And, more generally, the *Phys.* 6.6 consequence threatens to turn any putative unitary change into an arbitrarily large collection of other changes. The best way for Aristotle to avoid these problems would be to revisit and refine the view that changes are identified by their termini. *Phys.* 8.8, $262^{a}19–263^{b}9$, suggests a way ahead. Not just any termini can identify a change: the termini which individuate a change must be states of rest. Candy undertakes a single walk when she passes from being stationary in one place to being stationary in another; and the existence of an infinite number of points in between at which

she *could* (but in fact *does not*) stop does not divide her walk into an infinite number of already completed (and yet to be completed) walks. Full discussion of these issues would be difficult. But the relevant point for present purposes is more limited.

We started with an objection: that walking, a star example of a change, seems not to count as a change by the present–perfect test. Aristotle's initial reply relied on the view that changes can be more accurately identified by reference to their termini. That view has been refined: changes can be identified only relative to states of rest. But now the original objection appears to resurface. Candy starts at A, walks twenty miles in four hours to B, and then stops there. Consider the situation after five miles and one hour. At that time Candy is walking. And it is also the case then that Candy has walked (for example, ten minutes earlier). So the present 'Candy walks' and the perfect 'Candy has walked' are not incompatible. Aristotle cannot now reply that these walkings should be distinguished by their termini, since the only identifying termini in play are A (where she started an hour earlier) and B (where she will rest in three hours' time). And this is a significant problem, since a mismatch between the present–perfect test and Aristotle's star examples would suggest that the change–actuality distinction involves serious confusion (as Ackrill 1965 alleges).

Perhaps the distinction can be rescued by focusing attention on precisely what it is that the present–perfect test requires—and in particular on the question of how the perfect verb forms to which the test appeals should be understood. The ancient Greek perfect indicates aspect (Graham 1980; M. J. White 1980; Kosman 1984: esp. 123–7; Burnyeat, forthcoming). It need not function as a tense at all. 'A has ϕ-ed' indicates that A's ϕ-ing is complete and successful; it need not be locating A's ϕ-ing in the past. A couple of examples from English illustrate the point. At the very instant the King dies, his heir can say: 'I have inherited the throne.' 'I have inherited' (perfect) does not indicate tense (it does not refer to some past inheriting), but aspect (the inheritance is accomplished at the instant the previous king dies). And the very second Candy is introduced to Merle, she can say 'I have met the man I will marry': this does not pick out any romantic meeting in the past. Whether Aristotle uses the perfect *only* to indicate aspect, and *never* to indicate tense, is less clear (he uses it with past force at *Phys.* 4.13, $222^{b}9$–12, and *Poetics* 20, $1457^{a}17$–18). Nevertheless, Aristotle's present–perfect

test will mark a clear change–actuality distinction, in line with his star examples, and immune from problems concerning the proper identification of changes, so long as the only use of the perfect *relevant to the test* is to indicate aspect, and any uses of the perfect to refer to the past are discounted.

Go back to the troublesome walking example. Consider first a claim qualified by reference to a terminus: 'Candy is walking to Sheffield.' If this is true, could it also be true that she has walked to Sheffield? Perhaps so, in virtue of past journeys—but those cases are to be discounted. Could it be true that she has walked to Sheffield in respect of her present journey? Plainly not, if she is still walking there: for 'Candy has walked to Sheffield' to be true in respect of her present journey would require the journey to be complete and Candy to be in Sheffield. Consider instead then the unqualified 'Candy is walking'. That is true one hour into her journey. Could it be true at that time that Candy has walked? Perhaps so in virtue of the past: previous journeys, or what she was doing ten minutes ago. But such uses of the perfect are being discounted. Could 'Candy has walked' be true at that time in virtue of a present journey being complete? Surely not. For Candy's *present* journey is identified by terminal states of rest. Since 'Candy is walking' is true, Candy is precisely *not* at rest, her present journey is *not* complete, and the aspectual use of 'Candy has walked' *cannot* be true. Conversely, if an aspectual use of 'Candy has walked' *is* true, then Candy is at rest, in which case it is false that Candy is walking. The present–perfect test delivers the verdict that the star example walking is indeed a change.

Now consider a star example of an actuality: seeing. Actualities go on through time. Candy was lucky to be seeing the Loch Ness monster for a full ten minutes, whereas most others see the beast for only a few seconds. But, while Candy's seeing occupied ten minutes, it did not develop or progress throughout that ten minutes. Actualities which go on through time do so homogeneously. So 'Candy has seen the Loch Ness monster' (perfect) will be true either at *no* point in the period throughout which it is true that Candy is seeing the Loch Ness monster (present), or at *every* point in that period—since there would be no reason for the perfect to be true at one point rather than any other. The first alternative, that the perfect is never true, is unacceptable. So, whenever the present is true, the perfect is true (the present entails the perfect). Further, all that could render 'Candy has seen the Loch Ness monster' true at

a time is Candy's seeing the Loch Ness monster at that time, since we are discounting uses of the perfect which refer to the past. So, whenever the perfect is true, the present is true (the perfect entails the present). According to the present–perfect test, a star example seeing is indeed an actuality.

7. $1048^{b}18$–35: The Place of the Passage in *Metaphysics Θ*

The textual pedigree of $1048^{b}18$–35 is dubious. Aristotle's *Metaphysics* comes to us through two independent traditions, α and β. α rests on two manuscripts, J (ninth century) and E (tenth century); β rests on a twelfth-century manuscript A^{b} (fourteenth century and following α from *Λ*7, $1073^{a}1$, onwards). The passage $1048^{b}18$–35 is found in the A^{b} tradition, but is missing from EJ. Further, in A^{b} there is a vertical line drawn through lines 28–35 ('Of these . . . but that thing a change'), which appears to indicate (at least) those lines for scribal deletion. And the text itself is unusually corrupt even when it does occur. While it is difficult to judge with confidence what to make of the poor textual status of $1048^{b}18$–35, Burnyeat has argued that the lines are genuinely Aristotelian material which were placed here as a later marginal note—in the way in which a modern writer might insert a footnote—and then incorporated into the text. One can imagine reasons why this material might have been inserted here, either as a quotation from elsewhere in Aristotle or as a summary of an Aristotelian position. Earlier in *Θ*6 ($1048^{b}3$–6, 8) Aristotle has given the change–capacity relation as an instance of the actuality–potential schema; a summary of Aristotle's distinction between incomplete and complete changes might have been provided in order to help those familiar with *EN* 10.4. Perhaps someone was concerned about God's thinking activity, in case the focus on change–capacity and substance–matter ($1048^{b}8$–9) should be taken to imply that God changes; reference to understanding and thinking as actualities ($1048^{b}23$–4, 34) would be intended to guard against that implication (on all this see Burnyeat, forthcoming).

There is disagreement over how the terminology introduced within $1048^{b}18$–35 relates to the terminology used in the rest of *Met. Θ*. Does $1048^{b}18$–35 introduce a pair of coordinate terms (change and actuality), picking out different species of a higher genus (perhaps 'action', as $1048^{b}18$)? If so, then $1048^{b}18$–35 is the

only place in the Aristotelian corpus to suggest this terminology (the distinction itself, between actions which do and those which do not issue in a distinct result, does occur elsewhere: the point at present concerns *terminology*). Further, the costs of incorporating another sense of change and actuality as coordinate terms into *Met. Θ* are very high: both the key terms in *Θ*—*energeia* and *dunamis*—would then apply at the schematic level (actuality–potentiality) and at the lower level (*energeia* as actuality contrasted with change; *dunamis* as capacity).

There are two possible strategies concerning the terminology of 1048^{b}18–35. One would be to accept that 1048^{b}18–35 does introduce actuality and change as coordinate terms, but to emphasize the uniqueness of that recommendation; one can then accept that the recommendation engenders confusion, while insulating it from the rest of the Aristotelian corpus (and from the rest of *Met. Θ* in particular). That strategy would fit nicely with a view of 1048^{b}18–35 as a textual intruder at this point in *Met. Θ*, representing a non-Aristotelian writing-up of an Aristotelian distinction.

An alternative would be to deny that 1048^{b}18–35 really does recommend a use of actuality and change as coordinate terms. The apparent recommendations at 1048^{b}28 and 34–5 could be taken as misleadingly compressed. *Actuality* functions only as a general, schematic term. A central thesis of the main part of *Θ*6 is that one type of actuality is change (1048^{b}6–8). Change is an incomplete actuality (*Phys.* 3.2, 201^{b}27–202^{a}3; *An.* 2.5, 417^{a}16–17; compare *Met. Θ*6, 1048^{b}29–30). The passage 1048^{b}18–35 registers the point that seeing, understanding, thinking, and the like are not incomplete, in the way that change is. No specific term is introduced for those cases. Reference to them as actualities (1048^{b}28, 34–5) should be understood on the model of reference to (non-human) animals. *Animal* is a generic term which refers to humans and to many other species. The use of *animal* to refer just to the non-human species (for example, in the contrast between animal rights and human rights) does not introduce a new sense for the term, distinct from the generic (and in which sense humans are not animals): it is rather a loose but convenient use of the generic term. The claim that seeing, understanding, and thinking are (complete) actualities should be heard in the same way as the claim that dogs, cats, and hamsters are (non-human) animals (see Menn 1994: esp 105–13).

It is less urgent to decide on the terminology introduced at 1048^{b}18–35—for example, whether 'actuality' does or does not have a narrower meaning than 'actuality'—if the notion of a complete action (for example, seeing, thinking) does not play a central role in the overall arguments of *Met. Θ*. There are three points to note here:

(i) The change–actuality distinction does not seem crucial to *Θ* as a whole. As noted earlier (§§2, 4 above) neither the discussion of the capacity–change relation in *Θ*1–5, nor the examples at *Θ*6, 1048^{a}37–1048^{b}2, suggest any concern with the change–actuality distinction. The distinction appears in an argument by cases at *Θ*8, 1050^{a}23–1050^{b}2 (though the change and actuality terminology is not used); but the conclusions Aristotle is aiming for there, that substance and form are actuality (1050^{b}2–3) and that actuality is prior in substance to potentiality (1050^{b}3–4), do not specifically concern the *Θ*6, 1048^{b}18–35, notion of actuality.

(ii) This impression is reinforced by the doubts over the textual status of 1048^{b}18–35. It must be possible to understand the subsequent arguments of *Θ*7–8 without reference to 1048^{b}18–35: otherwise those chapters, and *Θ* as a whole, would simply have baffled commentators such as pseudo-Alexander and Aquinas, who did not have the passage in their texts.

(iii) In the face of (i) and (ii), why should anyone try to assign a central role in the interpretation of *Met. Θ* to the 1048^{b}18–35 notion of a complete actuality? Some background is useful in answering this question.

At *An.* 2.5, 417^{a}21–417^{b}6, Aristotle describes a distinction between two types of (what we can neutrally call) *transitions* (see Burnyeat 2002 for a thorough discussion of this difficult text). In the first type of transition one property is replaced by its contrary (417^{b}2–3). For example, the pan of water which is initially cold (though potentially hot) comes to be (actually) hot; this transition is bounded by a pair of termini (cold, hot), one of which is the contrary of the other; the upshot of the transition is that the terminus *a quo*, being cold, is replaced by the terminus *ad quem*, being hot (recall Commentary, Chapter 2, §6[i], on this sort of change). In this type of transition the potential is replaced by the actual: first of all the water is potentially hot, and then it is not potentially, but actually, hot

(*Phys.* 3.1, 201^{b}11, when a house is built it is no longer build*able*). By contrast, Aristotle describes the second type of transition as that in which what is potential is (not replaced by, but is) preserved by what is actual (417^{b}3–5). For example, suppose I possess, but am not exercising, knowledge of mathematics; and then I start to exercise my knowledge (for example, I work through a proof on the board). I do not thereby lose the capacity which is my mathematical knowledge (compare *Met.* Θ6, 1048^{b}34–5); I do not cease to be capable of working through mathematical proofs as I actually work through a proof. Indeed, it is rather the case that the actual exercise of my knowledge preserves my knowing state, since knowledge that is never exercised is apt to fade. According to Aristotle the first type of transition is a genuine alteration (the water is altered in being heated), whereas the second is not (I am not altered in exercising my knowledge of mathematics).

Now some commentators read the distinction between change and actuality into the *De Anima* distinction between two types of transition (in particular Kosman 1984: esp.132). It will be very hard to make this parallel persuasive, because it seems implausible that the two distinctions should coincide: the *De Anima* passage will group together the transition from being sighted to actually seeing and the transition from being a trained builder to actually building, neither transition counting as an alteration (*An.* 2.5, 417^{b}8–9); whereas seeing is an actuality and building a change. But the more important point at present is that the assimilation of the change–actuality distinction to that in *An.* 2.5 suggests a gloss on one of the main themes of *Met.* Θ—the unity of the potential and the actual—which relies on particular features of the 1048^{b}18–35 notion of an actuality. If a potentiality is preserved in the corresponding actuality, rather than being replaced by it, then it would be plausible to say that the actuality is the full manifestation or expression of the corresponding potentiality; and then to use that relation between potentiality and actuality to elucidate the unity of potentiality and actuality.

The details of this interpretation are less important than its general character (see Kosman 1984, 1994, for the details): namely, that the unity of potentiality and actuality is explained by reference to features of the notion of a complete actuality. If 1048^{b}18–35 is to be accorded a central role in *Metaphysics* Θ, then some interpretation of that general form, which emphasizes the significance of the notion

of an actuality, has to be offered and defended. Such interpretations contrast with an alternative approach to *Metaphysics Θ* according to which Aristotle reaches his conclusions without concentrating especially on actuality as distinct from change.

My view is that the $1048^{b}18–35$ distinction between change and actuality is not crucial to *Met. Θ*. Later I offer a suggestion as to why the distinction might appear more significant for the overall project of *Θ* than it in fact is (Commentary, Chapter 7, §7 [iii]). In line with this deflationary view of the importance of $1048^{b}18–35$ to *Met. Θ* I prefer to remain neutral on the relation between the terminology introduced within $1048^{b}18–35$ (change and actuality) and the use of those terms elsewhere in *Θ*. The novel underlined forms are meant as a device which helps to preserve that neutrality without risk of confusion.

CHAPTER 7

1. An Overview of the Chapter

In the preceding chapter Aristotle has directed our attention to the potentiality–actuality schema, instantiated in different ways in the relation of capacity to change and matter to substance. The capacity–change relation has received a good deal of attention in the first part of *Metaphysics* Θ. Aristotle now clarifies the more difficult and novel application of the schema: the matter–substance relation. He does so by focusing on a very general question about potentiality–actuality.

The chapter opens with a bare statement of the question: under what conditions is something potentially ($1048^{b}37$)? Examples are provided to show that the question does not admit of an obvious answer ($1049^{a}1–5$).

Two broad sets of cases are then considered. First ($1049^{a}5–18$) he discusses various ways in which something is potentially such-and-such in that it is the starting point of an appropriate process which issues in what is actually such-and-such. He starts with cases in which something comes about as the result of the exercise of a *rational* capacity ($1049^{a}5–11$: for example, the capacity to build or the capacity to heal, leading to an account of what it is to be potentially a house or potentially healthy). This discussion is then extended to cases in which something results from changes produced in one thing by *something else's* exercise of *any* capacity, whether rational or non-rational ($1049^{a}11–12$: covering, for example, what it is to be potentially hot). Finally, there are the cases in which something changes because of the exercise of a capacity *in that thing itself* ($1049^{a}13–18$: leading to an account of what it is to be potentially a man).

In all these cases a connection emerges between the notion of pre-existing matter, which can be turned into such-and-such, and what is potentially such-and-such ($1049^{a}9–11$). The discussion draws on the account in Θ5 of the way in which capacities give rise to changes.

Second, Aristotle considers the way in which the matter which *is composing* something is potentially that thing ($1049^{a}18–1049^{b}2$): for example, some wood is potentially a box and matter of a

box (1049^{a}23–4). These cases need to be made clear, if both pre-existing and concurrent matter are to be brought under (one side of) the potentiality–actuality schema (recall Commentary, Chapter 6, §4 on the pre-existing–concurrent distinction). Aristotle cites some linguistic data in support of his position (1049^{a}18–24). He then draws two corollaries: first, a point about primary matter (1049^{a}24–7); and, second, a discussion of different types of predication, which confirms the appropriateness of the linguistic data previously appealed to (1049^{a}27–1049^{b}2).

The chapter closes with a summary remark (1049^{b}2).

2. Aristotle's Terminology

This chapter brings to the fore the difference between two ways in which Aristotle uses the term *potentially*. On the one hand, it is used as a one-place term: for example, in the opening question of this chapter (1048^{b}37: 'when each thing is potentially, and when not . . .'); and in the closing summary (1049^{b}2: 'it has been stated when potentially is said and when not'). The one-place usage was common in the preceding chapter (*Θ*6, 1048^{a}32, 1048^{b}10, 16) and in the chapters which follow (*Θ*8, 1049^{b}24, 1050^{b}7–8, 1050^{b}16–17; *Θ*9, 1051^{a}23–4, 29; *Θ*10, 1051^{b}28). In addition, *potentially* was used as a one-place term in *Met. H*6 (1045^{a}23–4: 'on the one hand matter and on the other form, the one potentially and the other actually'; 1045^{b}18–19: 'the final matter and the form are one and the same, the one potentially and the other actually'; 1045^{b}20–1: 'what is potentially and what is actually are in a way one'); and *Met. Θ* will provide material to explicate those claims in *H*6. On the other hand, though, the predominant use is the present chapter is as a two-place term: for example, 1049^{a}1: 'is earth potentially a man?', 1049^{a}5: 'this is potentially healthy' (also 1049^{a}8–9, 11, 16, 21–2, 23).

The two-place use itself calls for some preliminary comment. It will be convenient in what follows to abbreviate questions and claims about the two-place use: to ask, for example, about the conditions under which something A is potentially F. It is important not to be misled by that abbreviation. There are two points to bear in mind:

(i) Aristotle's discussion raises a difficult question: to what extent does something identified as potentially F have an identity in its own right, independently of being potentially F? Talk of an item A which

is potentially F is merely abbreviatory and is not intended to prejudge that question (for further comment on this issue, see §§6, 8 below).

(ii) Abbreviation of the two-place use covers two different cases: F can be a substantival term (as in 'A is potentially a man' (1049^{a}1)) or an adjectival term (as in 'A is potentially healthy' (1049^{a}5)). In the first case English often requires an indefinite article ('A is potentially man' is unacceptable, and there is not always an option such as 'A is potentially human': consider, for example, 'A is potentially (a) house/potentially (a) statue' (1049^{a}11, 17)). For convenience I will use the abbreviation 'A is potentially F', supplying an indefinite article only when English grammar requires it. It is important to bear in mind, however, that these indefinite articles do not occur in the Greek. This point is particularly worth noting, in light of the temptation to move from a locution such as 'A is potentially a house' to 'A is a potential house'; that move is far more tempting when substantival terms are present (there is no great temptation to move from 'A is potentially healthy' to 'A is a potential healthy'). And one should be extremely cautious of the locution 'A is a potential F'. For that way of talking greatly encourages the thought that potential houses and potential men are individual identifiable items (types of houses and men, distinct from the actual ones). Avoiding the locution 'A is a potential F' makes it easier to understand how Aristotle might resist the thought that the world contains identifiable potential houses and potential men. It is noteworthy that Aristotle does not talk of potential houses, potential men, etc. in *Met. Θ*.

How are the two- and one-place uses related? It is the two-place use ('A is potentially F') which is significant. The one-place use is best thought of as arrived at by contraction of the two-place use. In *Met. H*6 Aristotle is concerned with *correlative* potentialities and actualities. His claim at *H*6, 1045^{b}20–1, for example, is that what is potentially a *man* and what is actually a *man* are a unity: it is patently not a claim about the relation between what is potentially a *house* and what is actually a *box*. So it is the two-place use that is inherited from *Metaphysics H* and that will be clarified in *Θ*. But a good deal of the abstract argument can be put more concisely by means of the one-place use. Suppose I ask whether what is potentially a man is prior or posterior to what is actually a man: the question involves no special reference to *men*—the same answer will obtain as regards

what is potentially a man, potentially wheat, and potentially seeing (Aristotle's examples at *Θ*8, 1049^{b}19–24). So the question could be abbreviated: is what-is-potentially prior or posterior to what-is-actually? The abbreviation is even more attractive if variables are not commonly used (so that it would not be natural to frame the general question as: is what is potentially F prior or posterior to what is actually F?). But the abbreviation would be misleading if it led to a focus on the one-place use (*A is potentially*).

The same point holds for all general claims about correlatives. For example, *matter* and *form* are correlative notions: something is matter relative to a given form, or form relative to given matter (*Phys.* 2.2, 194^{b}8–9; *Met. H*3, 1043^{a}12–13). For something to be matter is for it to be the matter *of an F* for some formal description F—this is a point Aristotle brings out at 1049^{a}18–24. Nevertheless one can ask such general questions as 'is matter knowable?' or 'is it matter or form which is more properly substance?' without intending to legitimize non-relative notions of matter and form.

3. 1048^{b}37–1049^{a}5: Specifying the Question

This chapter builds in various ways on earlier discussion of the capacity–change relation. There is one issue which Aristotle is not much interested in. Since the capacity–change relation is itself a instantiation of the potential–actual schema, one could consider the way in which a capacity is potentially the changes to which it gives rise (for example, the sense in which the doctor's capacity is potentially the healings and harmings in which it issues). At this stage, however, Aristotle is more concerned with the matter–substance relation. Nevertheless the earlier account of capacities and changes casts light on that relation in another way. Aristotle's view is that it is because some matter is a suitable starting point for the production of something, by the exercise of a capacity, that the matter stands to that result as the potential to the actual (see further §§4, 5 below). The problem is then to get beyond this case to the sense in which the matter which *is composing* something (and so, in particular, concurrent matter) stands to what it is composing as what is potentially F to what is actually F. Considering different types of capacity and change enables Aristotle to extend his account from pre-existing to concurrent matter. That is what is required to justify the mapping of matter–form onto potentiality–actuality in *Met. H*6.

In order to motivate sympathy for his own rather restricted answer to the question 'when is each thing potentially and when not?' (1048^{b}37) Aristotle needs to show that the question does not admit of a more liberal answer. The most permissive answer that could be offered is that A is potentially F so long as it is *possible* to obtain something F from A, where the relevant notion of possibility is understood in terms of the Aristotelian test provided at *Θ*3, 1047^{a}24–6. As noted earlier, that test defines a standard modality: a notion of possibility such that something's being actual entails that it is possible (recall Introduction, §3, and Commentary, Chapter 3, §8). So, according to this permissive account, A will be potentially F for any F such that A *in fact* results in something F, no matter how much the transition from A to something F is due to interference: for example, a particular fertilized egg is potentially a non-viable deformed foetus, since generation sometimes does result in non-viable deformations.

Aristotle's remarks at 1049^{a}1–5 show that he rejects not only this most permissive position, but also a slightly more discriminating account. The position envisaged and rejected there (1049^{a}1: 'is earth potentially a man?') is that A is potentially F so long as there is some causal route—however extended—starting with A and ending up with something F. Suppose these cells have to develop into seeds, and those seeds germinate and then grow into moss, and that moss die and be compressed, in order for peat to result: then, according to this account, these cells are potentially peat. This is more discriminating than the most permissive account. It differs from Aristotle's own view as regards the *extent* of the causal route from A to something F. But it adds a requirement to the most permissive view, by insisting that all relevant capacities are exercised in normal conditions, and that nothing in the transition from A to something F is due to interference. Nevertheless Aristotle rejects this account too.

Why should such extended routes from A to something F be insufficient for A to be potentially F? There are two points. First, Aristotle can reasonably reject this account by fiat: if he wants to clarify the way in which the immediate matter of something F is potentially F, allowing distant causal precursors of something F to be potentially F will not contribute to that project. Second, the more distant that items can be from something actually F while yet counting as potentially F, the more items will count as

potentially F; so the notion of what is potentially F will become less discriminating, it will become less likely that anything significant can be said about it in general, and so it will seem less promising as a useful notion in Aristotle's overall metaphysical enquiry. (A third reason for Aristotle's rejecting the permissive account is more appropriately considered in §4 below.)

4. 1049[a]5–11: Rational Capacities

Aristotle starts with cases in which what is potentially F comes to be actually F *by thought*: for example, something which is actually healthy or actually a house comes into being (1049[a]7–11: the examples are classified differently at *Met. Z*7, where healing and building are productions by craft, as distinct from productions due to a capacity and due to thought). The exercise of a rational capacity is a transition between a pair of termini: a skilled builder starts with something, and something else results from his exercising his skill. The builder's skill stands to this exercise of his skill as something potential to something actual (being, in fact, a particularly clear case of the potential–actual schema). So, by analogy, the starting point (that is, what the skill is exercised on) stands to the end point (that is, what results from the skill's being exercised) as something potential to something actual. But the starting point, on which the skill is exercised, is precisely the *matter* (1049[a]9–10); and the end point is the substance-like item which results from the exercise of the skill (for example, the house (1049[a]10)). So we have two important results. First, that it is reasonable to claim (*Θ*6, 1048[b]6–9) that the matter–substance relation instantiates the potential–actual schema. And, second, that the exercise of a rational capacity effects a transition from what is potentially F to what is actually F.

Now Aristotle can derive from that second result an account of what it is to be potentially F. The exercise of a rational capacity takes us from what is potentially F to what is actually F: therefore something is potentially F when it is suitable for being turned into something actually F by an exercise of the appropriate rational capacity (1049[a]5–8: Aristotle immediately goes through the derivation in the case of what is potentially a house, at 1049[a]8–11). The details of his discussion reveal that a starting point is *suitable* when it requires only the exercise of the appropriate single rational capacity in order to result in an actual F (1049[a]11: 'nor is there anything

which needs to be added or taken away or changed'). The decision to understand *suitability* so narrowly calls for some justification, since it has important consequences for Aristotle's account of the conditions under which something is potentially F.

We should start with what Aristotle says about the transition from what is potentially F to what is actually F at 1049[a]5–7. It comes to the following:

[POT] Something comes to be actually F by means of thought from something A which is potentially F if and only if

if

(i) there is an agent with the appropriate capacity

and

(ii) that agent wishes A to become actually F and exercises the capacity accordingly

and

(iii) nothing external prevents A becoming actually F

and

(iv) nothing in A prevents it becoming actually F

then

(v) A becomes actually F.

Reference to an agent and a capacity are not explicit in 1049[a]5–7. But they are plainly required by talk of *wishing* and *thought* (compare reference to an agent in the analysis of coming-to-be in *Met.* *Z*7, e.g. 1032[a]12–14). *Wish* in (ii) is used semi-technically. A comparison with *Θ*5 shows that (ii) does not mean simply that the agent has some (defeasible) desire that A become actually F, but that the agent has decided to exercise her (two-way, rational) capacity so as to render A actually F. The parallel in *Θ*5 is *desire or choice* at 1048[a]11.

Once there is reference to an agent who brings about the transition from what is potentially F to what is actually F, then Aristotle's account of what it is to be potentially F follows naturally. It is not just any agent who can produce what is actually F: for example, not just any agent who can produce actually healthy individuals. The most obviously appealing characterization of the appropriate agents is in

terms of an appropriate capacity: those who can produce actually healthy individuals are those who possess medical skill (namely, doctors). So there will be, for each specific F, a specific capacity associated with the transition from what is potentially F to what is actually F: namely, that capacity which characterizes the sort of agent who can produce the transition (for example, medical skill is associated with the transition from what is potentially to what is actually healthy, building skill with that from what is potentially to what is actually a house, and so on).

This is why Aristotle places tight constraints on the conditions under which something counts as potentially F; and this is a third reason to reject the alternative permissive positions mentioned in §3 above. Something is potentially F just so long as something that is actually F can be produced from it by the appropriate agent: for example, something is potentially healthy just so long as a doctor can make it actually healthy. The appropriate agent is an agent with the appropriate capacity: for example, medical skill. So something is potentially F just so long as the exercise of the appropriate capacity can produce something actually F from it. For example, something is potentially healthy just so long as the exercise of medical skill can produce something actually healthy from it. But there is no reason to expect that in every case in which there is some extended causal route from A to something actually F there should be any appropriate capacity whose exercise would produce something actually F from A. Suppose that young Candy needs to grow to adulthood, then eat a certain diet, and then be treated by a doctor in order to become healthy. In that case there is indeed an extended causal route from young Candy to her healthy condition. But exercise of medical skill alone will not produce health in young Candy: correlatively, there is no single appropriate agent, whose deliberations can produce health in young Candy as [POT] requires. It is on those grounds that Aristotle would deny that young Candy is potentially healthy (notice the reference to a single capacity, *the medical craft*, at $1049^{a}3$–4; and compare the discussion at Frede 1994: 187–93). In short, A's being potentially F requires there to be some *single* capacity the exercise of which can produce something actually F from A. If there were no such capacity, there would be no non-arbitrary way of characterizing *the* (type of) agent appropriate for effecting the change from A to something actually F; and that consequence is unacceptable, given that all changes require an agent.

Explaining what it is for something to be potentially F by reference to a capacity (namely, to produce what is actually F) provides another close connection between the discussion of capacities in *Θ*1–5 and the broader discussion of potentiality and actuality in *Θ*6–9; and that gives further reason to prefer the Frede approach over the Ross approach to *Met. Θ* (recall Commentary, Chapter 1, §2).

Clause (iii) is included in [POT] because Aristotle mentions external conditions at 1049^{a}7 (and again at 1049^{a}13–14, in connection with internal capacities for change). However, (iii) might give pause for thought. [POT] is plainly intended to parallel the principle in *Θ*5 about the relation of two-way capacities to their exercise (1048^{a}13–15; see Commentary, Chapter 5, §§1, 9, on [C]). But Aristotle went out of his way in *Θ*5 to say that reference to the absence of external interference is not strictly required in framing that principle (*Θ*5, 1048^{a}16–21, and Commentary, Chapter 5, §11). There is no serious inconsistency here, though. Aristotle is able to make some of his points in *Θ*5 about capacities and their exercise at a fairly general level; and at that level he is able to ignore important questions about the proper specification of the content of capacities. Those questions did, however, come to the surface at 1048^{a}16–21: that is why it is in that passage that Aristotle claims that the absence of external interference is properly to be included in the content of a capacity. In the discussion in *Θ*7 Aristotle is again engaged in matters at a fairly general level. He need not consider issues about the proper identification of capacities in order to make the point he wants: namely, that the notion of something's being potentially F is to be understood in terms of the capacity to produce something (actually) F.

Note the translation *in fulfilment* at 1049^{a}5–6. This marks a rare occurrence of the term *entelecheia* in *Met. Θ*; it is more common for Aristotle to use the term (*energeia*), which I translate *actuality*. The less common term is found also at *Θ*3, 1047^{a}30, 1047^{b}2 (see Commentary, Chapter 3, §10; and, more generally, Introduction, §4). Its use in the present passage, as at *Θ*3, may be intended to suggest reference to the account of change in *Phys.* 3.1.

5. 1049^{a}11–18: Two Further Types of Capacity

What Aristotle has said so far is limited to rational (two-way) capacities possessed by one thing to produce actual Fs from something else. Aristotle now extends his account to two further types of capacity.

First, and very briefly, there is an extension to non-rational (one-way) capacities possessed by a bearer to produce changes in something else (1049[a]11–12: 'as many other things of which the origin of coming to be is external': this comment does not merely generalize over other rational capacities besides building and healing, since it explicitly takes in all other non-internal capacities). An example would be a fire's capacity to heat. Something is potentially hot—for example, a pan of cold water—just so long as bringing it into contact with the appropriate agent (namely, something with the capacity to heat, such as a fire) in normal conditions (that is, in the absence of such external hindrances as cooling winds) results in its becoming actually hot. Just as in the previous case, it is insufficient for B's being potentially F that there is some extended causal route from B to something actually F.

Second, and at greater length, the account is extended to capacities possessed by something to produce changes in itself (1049[a]13–18). These are the types of capacity which are natures (*Θ*8, 1049[b]5–10; recall Introduction, §5). In this case something is potentially F when it is such that an exercise of *its own* appropriate capacity (namely, that capacity the exercise of which results in *its bearer* becoming actually F) in normal conditions (namely, in the absence of external hindrances) does indeed result in its becoming actually F. For example, the fertilized spawn is potentially a frog so long as the exercise of some capacity it possesses will, in normal conditions, result in an actual frog; in contrast, the sperm is not potentially a frog if its resulting in an actual frog, in normal conditions, requires the exercise of some capacity possessed by something other than the sperm (for example, the (passive) capacity of a frog egg to be fertilized by the sperm).

There is good reason for Aristotle to consider the cases in the order he does (rational capacities, non-rational capacities, internal capacities). The crux of Aristotle's discussion so far is that something is potentially F so long as the exercise of an appropriate *single* capacity can produce something actually F from it. In order to make that position plausible, it is advisable to start with the cases in which reference to a *single* appropriate capacity is least problematic. Cases in which deliberation is relevant to the transition to an actual F fit the bill nicely. The need to identify a single deliberating agent is apparent; and that agent is most plausibly characterized as the possessor of a *single* capacity (who decides whether to turn those

materials into a house? Someone with a full grasp of *the* building craft). In contrast, cases in which there is no distinction between agent and patient are the most difficult.

6. 1049ª5–18: Four Consequences

Four general consequences of Aristotle's discussion so far are worth flagging.

(i) Aristotle's strategy, of explaining what it is to be potentially F in terms of what is suitable for turning into an actual F through an exercise of the capacity to produce Fs, will translate into stringent identifications of what is potentially F in particular cases. Consider the illustration of this account in the case of what is potentially a house at 1049ª8–11, which is extremely restrictive. If something is to be potentially a house, it must be such that nothing need be added to it, or taken away, in order that it can be turned into an actual house: no further bricks are needed, none of the wood is rotten or infected, there are no superfluous timbers to be cleared away afterwards, so that we have a finished house rather a building site.

That suggests that it may be impossible to tell whether some pile of bricks and wood in front of me *is* potentially a house. Perhaps it is only when I start building with them that I find that there are not enough appropriate timbers to make a house. Further, it should not be unexpected that Aristotle's strategy will generate such a restrictive account. What characterizes a builder is that she has an understanding of what houses are (compare *Met.* *Z*7, 1032ª32–1032ᵇ3: as Aristotle puts it, the form (of house), that is, the essence (of house), is in the builder's soul). Understanding what houses are will involve knowledge about appropriate and inappropriate types of materials (walls must support a roof: so stone is, but straw is not, suitable wall-building material). But it is not essential, for example, that a builder be physically capable of erecting houses; and the practical job of gathering or sorting through the materials for the construction of a house is no part of understanding what a house is. So, if these materials here are in fact inappropriate or insufficient for the construction of a house, they will not be suitable for turning into a house simply by an exercise of the builder's craft; and so, given Aristotle's strategy, they will not be potentially a house.

(ii) What this brings out is that the identity of some materials as *potentially a house* is entirely dependent on their being suitable for

transformation into an actual house. So far as Aristotle's account goes, there need not be any way to pick out what is potentially a house, other than as just and precisely what a builder can turn into a house. That is a significant consequence if we are to make sense of the idea, inherited from *Met. H*6, that the concurrent matter of an F is potentially an F. (Compare $1049^{a}27–1049^{b}2$ and §9 below.)

(iii) The account provided explains what it is to be potentially F by reference to the notion of a *single* capacity (something is potentially F so long as the exercise of an appropriate single capacity can produce something actually F from it). Therefore some background understanding of capacity identity is required: what fixes that building skill, medical craft, and heat are each single capacities? The answer will appeal to the notion of a single form. Building skill, for example, is a single capacity (although it involves sub-competencies, such as an understanding of foundations and the structure of roof timbers) because there is a single form, some single characterization of what it is to be a house, grasp of which constitutes the builder's skill.

Now, on the one hand, it is a pleasing consequence of Aristotle's approach that it relies on general connections between the notions of a capacity to give rise to Fs, the form F, and being potentially F. For those general connections dovetail nicely with the ideas in *Met. H*6 (the links between matter and potentiality, form and actuality). On the other hand, though, it is clear that Aristotle's account of what it is to be potentially F incurs high metaphysical costs. It requires a one–one correspondence between forms in the world (for example, human health) and the capacities developed by rational agents (for example, medical skill): and it may be hard to justify the conviction that the correspondence obtains (compare Commentary, Chapter 2, §7: there are related difficult issues raised by Aristotle's view that rational capacities map onto a distinction between positive forms and privations).

(iv) Aristotle need not be concerned that his account does not deliver clear verdicts on particular cases. For example, it may be unclear whether Candy, in the particular condition she is in, is potentially healthy or not; or whether what I have in front of me is potentially a wagon; or under what conditions I have something that is potentially human. Such questions are of varying degrees of significance: the final one may be of great importance for medical

ethics. But the issues in *Met. Θ* are very general: for example, what is the connection between matter and potentiality, are there any actualities which are not associated with a potentiality? From that point of view it does not matter that Aristotle's account of what it is to be potentially F does not help to determine verdicts on specific cases.

7. 1049[a]18–24: Matter and Potentiality

Aristotle has explained that something is potentially F when it is suitable for being turned into an F by an appropriate agent. It follows that the matter which pre-exists an F, and which could be turned into an F, is potentially F. Before the builder gets to work, the bricks and timber are potentially a house: and the unwrought is potentially what has been finished off (*Θ*6, 1048[b]3–4). But establishing that conclusion cannot be all there is to showing how matter–substance instantiates the potential–actual schema (*Θ*6, 1048[b]4–9). For that limited conclusion is consistent with its being the case

(*a*) that the pre-existing matter of an F ceases to be potentially (an) F once it has been turned into an F: the wood was potentially a box before the carpenter got to work, but it ceased to be potentially a box once she made it into a box;

and

(*b*) that the concurrent matter of an F is never potentially an F: baked clay is not suitable for turning into tiles, nor flesh and bone for turning into animals.

Now many will find it intuitively plausible to say, for example, that the bricks now composing my house are no longer *potentially* a house, and that my flesh and bones are not *potentially* human. So why should Aristotle want to avoid (*a*) and (*b*), and accommodate the idea that the matter composing an F is also potentially F?

Notice first that Aristotle recognizes that there is *some* potentiality which the bricks and wood have lost when they compose a house: namely, the potentiality to be *turned into a house*. As he puts it at *Phys.* 3.1, 201[b]11, once the house exists we no longer have something build*able*. But the question is not whether the matter composing a house has a potentiality whose correlative actuality is a *change* (that is, an instance of building (*Phys.* 3.1, 201[b]8–10)). Aristotle

is clear that it does not. The question is rather whether the matter composing a house has a potentiality whose correlative actuality is a (quasi) *substance* (that is, a house). Why should Aristotle want to say that it does?

The core notion of the matter of an F is what composes an F (recall Commentary, Chapter 6, §4). Aristotle's examples at *Θ*7, $1049^{a}23–4$, bear this out: wood is matter for boxes (and boxes are certainly composed of wood), this wood is matter for this box (and this box is composed of this wood). If the matter composing an F—the core notion of matter—does not have the potentiality to be an F, then there is not really any general connection between matter and potentiality. But in that case the mapping of form–matter onto actuality–potentiality suggested at *Met. H*6 ($1045^{a}23–5$, $1045^{b}16–23$) fails; the point of *Θ*6's carefully drawn analogies between capacity–change and matter–substance is opaque, and the claim at $1048^{b}4–9$ that matter–substance falls under the potential–actual schema is at best very misleading.

Further, a conclusion which applied only to the matter of an F before it is turned into an F would contribute nothing to the questions raised in *Met. H*. The issue in *H*6 is the relation between a substance and its immediate matter, and the immediate matter of individual living things is concurrent matter: animals are not composed of pre-existing flesh, blood, and bone. And, even if that were not the case—even if animals could be put together out of pre-cultivated flesh and bone—what is problematic is how a substance can preserve a unitary nature once it does exist as a material composite (recall Introduction, §6).

So, are there any good reasons to extend Aristotle's intermediate conclusion (that something is potentially F when it is suitable for an appropriate agent to turn into an F) and establish a more general connection between the matter of an F and what is potentially F? Here are three arguments.

(i) Matter which can be turned into an F is potentially (an) F. In any particular case there will be certain properties of a type of matter in virtue of which it is the type of stuff which can be turned into an F: bricks are appropriate for building houses in virtue of being rigid and strong, copper is appropriate matter for making into springs in virtue of being pliable. But the matter which *composes* an F retains those very properties which made it suitable for turning into an F

in the first place: the bricks remain rigid and strong when they are made into a house, the copper remains pliable when it composes a spring. So we have reason to say that the matter which composes an F is potentially F, and stands to the F which it composes as something potential to something actual. For it retains those properties which rendered it potentially F—which rendered it suitable for turning into an F—in the first place (for this line of argument, see Freeland 1987: 396–8, 404–6; Frede 1994: 191–2).

The trouble with this argument is that it lacks generality. It is, of course, *sometimes* the case that the matter composing an F retains the properties which made it suitable for turning into an F in the first place (for example, the rigidity and strength of the bricks). But there is no reason to suppose that is *generally* the case. There are different ways in which it can fail. It may be that the properties are simply not retained at all in the course of coming to compose an F. Copper is suitable for turning into wire because it is extrudable; but, once the copper has been drawn into wire, it cannot be further stretched. Or it may be that, while the property in virtue of which the matter can be *turned into* an F is retained, nevertheless that is not the property in virtue of which the matter can *compose* an F. Bronze is suitable for turning into axe blades because it is malleable; but it is because bronze is hard, and not because it is malleable, that it is suitable for composing axe blades.

(ii) The second argument moves from the view that capacity–change is an instance of the potentiality–actuality schema to the conclusion that matter–substance is an instance of the same schema. So the argument aligns nicely with the overall structure of *Met. Θ*.

The argument appeals to three points about types of matter composing types of thing (the relation Aristotle mentions at *Θ*7, 1049^{a}23–4): for example, clay composing a sphere; foundation stones, bricks, roof timbers composing a house; bone, flesh, and blood composing a human body.

(*a*) In each case the type of matter has certain capacities in virtue of which it can compose an F: if the matter did not *possess* those capacities then it *could not* compose an F (for example, if clay were not cohesive it could not maintain its shape and compose a sphere; if bone were not rigid it could not support tissue and compose a human body).

(*b*) In composing an F the matter is exercising those very capacities which it has to possess in order to be suitable for composing an F: if the matter did not *exercise* those capacities then it *would not be* composing an F (for example, in composing a sphere clay is actually cohering, and if it were not cohering it would not be composing a sphere; in composing a human body the bone is actually supporting tissue, and if it were not supporting tissue it would not be composing a human body).

(*c*) What it is for there to be an F is just for the appropriate matter to be composing an F (some clay composes a sphere if and only if a sphere exists; bone composes a human body if and only if a human body exists).

Points (*a*)–(*c*) get Aristotle most of the way to the conclusion he wants: (*a*) connects (the) *matter* (composing an F) with (certain) *capacities* (in virtue of which it can compose an F); (*b*) and (*c*) connect (the existence of a) *substance* (F) with (the) *exercise* (of those capacities). And, since capacities stand to their exercise as potentiality to actuality (as explained in *Θ* 1–5), it is reasonable to conclude that matter–substance also instantiates the potentiality–actuality schema.

The final step of the argument is to adjust the type of example used in (*a*)–(*c*). The conclusion Aristotle wants is that the matter composing an F stands to the F which it composes as something potentially F to something actually F. So we need to focus on some potentiality (capacity) associated with matter, of which the correlative actuality (exercise) *is* the substance which the matter composes. The examples in (*a*)–(*c*) were of types of matter which partially compose an F. It is true that the exercise, for example, of bone's capacity to support tissue is *involved in* the existence of a human being (or is *part* of what it is for a human being to exist): but it is not true that the exercise of bone's capacity to support tissue *is* a human being.

However, the final step is fairly easy. Consider the sum total of the matter which at a certain time composes a particular F: for example, the foundation stones, timbers, bricks, etc., which compose this particular house right now; the blood, bone, muscle, etc., which compose this particular body right now. The different types of matter have certain capacities (for example, foundation stones have

the capacity to prevent walls sinking into the ground). As a result, that-matter-taken-as-a-whole has a certain capacity: namely *to be a house*. And the actuality correlative to that capacity is: *being a house*.

So the *matter* which is right now composing this F has a *potentiality* to be an F, and the correlative *actuality* is the *substance* F which the matter composes. This gives the general connection between matter and potentiality which Aristotle requires.

(iii) Aristotle wants to establish a general parallel. Matter–substance and capacity–change instantiate the same schema: in both cases something stands as potentiality to actuality (*Θ*6, 1048^{b}4–9). But some capacities and changes display a feature which obscures that parallel. If that feature is set aside, we will be better able to appreciate the analogies between matter–substance and capacity–change.

In some cases a capacity stands in a diachronic relation to its exercise: the capacity, as it were, 'turns into' its exercise, and the capacity does not exist at the same time as its exercise. For example, first of all glass has the capacity to shatter, and salt the capacity to dissolve. Then in being exercised these capacities are lost: shattered glass does not have the *capacity* to shatter, but is *actually* shattered. That feature obscures any parallel with the relation of matter to the substance it composes, since that relation is synchronic: the matter exists at the same time as the substance it composes.

However, it is only *some* capacities which stand in a diachronic relation to their exercise. We can distinguish among capacities between the following two cases:

[LOSS] A loses the capacity to ϕ as a consequence of having exercised it (having ϕ-ed).

[NOLOSS] It is not the case that A loses the capacity to ϕ as a consequence of having exercised it (having ϕ-ed).

For example, salt's capacity to dissolve and the capacity of glass to shatter satisfy [LOSS]; my capacity to see and copper's capacity to conduct electricity satisfy [NOLOSS]. (In addition further relations between capacities and their exercise can be made out, such as

[RET] A retains the capacity to ϕ as a consequence of having exercised it (having ϕ-ed).

[GAIN] A gains the capacity to ϕ as a consequence of having ϕ-ed.

My capacity to speak French and rubber's capacity to be stretched satisfy [RET], Candy's capacity to play the piano and the virtues satisfy [GAIN]. And it may be possible to establish interesting logical entailments between these relations: for example, that any capacity which satisfies [RET] satisfies [GAIN]. But those are not issues to pursue here—though see also Commentary, Chapter 8, §3, on [GAIN].)

If we concentrate on capacities which satisfy [NOLOSS], then the capacity–exercise and matter–substance parallel will *not* be obscured. For a capacity which satisfies [NOLOSS] stands in the same sort of synchronic relation to its exercise as the matter composing a substance stands to the substance it composes; and so there is as much reason to see the one relation as the other as instantiating the potential–actual schema.

This is a point worth emphasizing, because it seems that Aristotle does in fact intend the matter–substance relation to be clarified by just such capacities as satisfy [NOLOSS]. Aristotle is certainly aware of the distinction between [NOLOSS] and [LOSS], as his discussion at *An.* 2.5, $417^{a}21$–$417^{b}6$, makes plain (recall Commentary, Chapter 6, §7). He there contrasts two types of transition, in each case from something potential to something actual. In the one case the starting point of the transition is *replaced* by its contrary (for example, the pan of water starts out as potentially hot though actually cold, and ends up in the opposite condition as actually hot, the water's coldness being replaced by the fire's heat; compare *GC* 1.7, $324^{a}8$–12). In the other case the starting point is *preserved* in the transition (for example, the builder's skill is manifested and developed in her building activities, rather than being used up or replaced by them). The first type of transition involves *alteration* of the subject, the second does not: water is different before and after being heated in a way that a builder is not different before and after starting to build.

Now it seems clear that Aristotle means us to think about capacities which are preserved in, rather than those which are replaced through, their exercise, in considering the connection between the capacity–exercise and matter–substance relations. First, each of the three pairs of examples of the capacity–change relation provided at *Met.* Θ6, $1048^{a}37$–$1048^{b}2$, is such that the transition from one to the other is a preservation rather than a replacement (I do not lose my building capacities in building, nor my unexercised capacities

to hear, talk, walk about, etc. when I awake, nor my capacity to see when I open my eyes). Second, the fact that it is *this* type of capacity–exercise relation which parallels the matter–substance relation means that there is no particular difficulty with the matter composing a substance (as opposed to the matter which can be turned into a substance). For the synchronic relation of composing-matter to composed-substance is elucidated, rather than obscured, by the relation between those capacities preserved in being exercised and their exercise.

Notice, finally, a striking consequence of the fact that Aristotle directs attention to capacities which are preserved in their exercise—capacities which satisfy [NOLOSS]. His particular interest in those capacities may help to explain why some commentators have been misled about the importance of *Met.* Θ6, 1048^{b}18–35 and the change–actuality distinction; and why, if the passage is indeed a later insertion, it should have been placed at the end of Θ6 (see Commentary, Chapter 6, §§6, 7). For there is a feature of capacities which satisfy [NOLOSS] which (*a*) is crucial for their clarifying the matter–substance relation and (*b*) could be confused with a distinct feature of the actualities introduced in 1048^{b}18–35.

(*a*) Capacities which satisfy [NOLOSS], which are preserved in their exercise, can be *exercised repeatedly*. This applies to both changes and actualities. On the one hand, (a change) there is nothing in the act of building which 'uses up' the builder's skill; and, since a builder is not altered in exercising her skill, there is no intrinsic reason why, having built once, she should not build again, and then again, and so on. These repeated acts *have* to be different acts of building, because each will terminate in the construction of a house, since building is a change. On the other hand (an actuality) the capacity to see satisfies [NOLOSS], and can therefore be exercised repeatedly. These too *could* be different acts of seeing, although they do not *have* to be, because seeing does not issue in a result, since it is an actuality.

It is important that the type of capacity which elucidates the matter–substance relation should admit of repeated exercise: for the relation of matter to the substance it composes is *enduring*. There may well be features of the particular matter and substance in

question which mean that the substance will eventually decompose (as the human being eventually dies), but it is not simply the fact that the substance is composed of concurrent matter which brings that about.

(*b*) *Θ*6, 1048^{b}26–7, explicitly flags the following feature of actualities. If ϕ-ing is an actuality, then an act of ϕ-ing does not give rise to a distinct result; and so a single act of ϕ-ing could be prolonged without limit. For example, there is no intrinsic limit to how long I can engage in an act of seeing, whereas an act of building will come to an end as soon as the house in which it terminates comes about.

Now it is quite a delicate matter to state clearly the relation between these two features

(*a*) that a capacity can be exercised repeatedly

and

(*b*) that an exercise of a capacity can be prolonged without limit.

They are distinct: the capacity to build satisfies (*a*) but not (*b*). But they are not incompatible: the capacity to see satisfies both (*a*) and (*b*). And arguably they are not logically independent either: if a capacity satisfies (*b*) and its exercise can be prolonged without limit, then it satisfies [NOLOSS], and if it satisfies [NOLOSS] then it satisfies (*a*). That argument in fact raises complicated issues. But the salient points for present purposes are that it is feature (*a*), possessed by capacities which satisfy [NOLOSS], which is important for clarifying the matter–substance relation; that (*a*) could be confused with (*b*), which is a feature of actualities; and that, if (*a*) were confused with (*b*), then the actuality–change distinction at *Θ*6, 1048^{b}18–35, would seem far more significant for the overall project of *Met. Θ* than it does otherwise.

8. 1049^{a}18–24: Some Linguistic Data

Aristotle now appeals to some linguistic data to confirm his view that there is a connection between what is the immediate matter of something and what is potentially that thing. Note that the linguistic data Aristotle refers to do not *constitute* the metaphysical position he is interested in presenting (that the immediate matter

of an F is potentially an F). The metaphysics could be explicated independently of the linguistics (as it was at §7 above). The claim is rather that the language *confirms* a position which could be independently established. So from that point of view it would not be of any great significance if the linguistic phenomenon were a local feature of ancient Greek; or if the same metaphysical thesis could equally well be illustrated by some distinct but similarly local feature of contemporary English. (A similar point applies to the use at *Θ*6, 1048^{b}18–35, of the present–perfect relation as a marker of the change–actuality distinction; see Commentary, Chapter 6, §6.)

The phenomenon to which Aristotle points concerns word endings. We do not call this box *wood* but *wooden* (1049^{a}19–20). The contrast is more easily seen in English if we consider not the forms 'that box is wood'/'that box is wooden'—which seem equally acceptable—but rather such locutions as 'there is a wooden box' and 'there is a wood box', where the former certainly does seem more natural. Aristotle takes the *en*-ending to track the immediate matter of something which is potentially that thing: the fact that we call that box wood*en* indicates that wood is *matter* of the box (1049^{a}23, 25–6, 27, 1049^{a}36–1049^{b}1), that it is the *immediate* matter of the box (1049^{a}21–2), and that it is *potentially* the box (1049^{a}21, 23).

The *en*-idiom is presented as relevant to two types of application (1049^{a}23–4): either concerning types of item (boxes are wooden, coats are woollen), or concerning individual items (that box is wooden, that coat is woollen). And Aristotle points out that we can identify matter–substance relations also either in the case of types of substance (wood is the matter of boxes, flesh and blood of humans) or in the case of particular substances (this wood is matter of this box, this flesh and blood is matter of this human).

This calls for further comment. It was noted earlier (§6 (ii)) that a consequence of Aristotle's account (1049^{a}5–18) of the conditions under which something is potentially F is that the identity of matter is dependent on the identity of the substance in which it can eventually issue. *This matter* is what is potentially *an F*, and is exactly and only the matter which when appropriately worked on issues in *this F*. Given that consequence, there is no reason to suppose that there should be any way of picking out some more or less inclusive parcel of matter which is either more or less than is required for the production of an F. For example, there is no reason to suppose that

there should be any way to pick out just *some* of the matter which composes this human being, or to pick out just some of the matter composing this tree along with some of the matter composing this frog.

However, this consequence may seem inconsistent with Aristotle's reference at $1049^{a}24$ to *this wood* as matter of *this box*. For *this wood* looks precisely as if it picks out some matter just as a parcel of matter. In fact though, $1049^{a}24$ is neutral on this issue. The claim at $1049^{a}24$ is just that there is some relation between a (quasi) substance (*this box*) and the matter which composes it (*this wood*)—namely, that the matter is potentially the (quasi) substance—and that that relation is marked by the *en*-idiom (this box is wood*en*). That claim is quite consistent with holding that the matter can be identified as *this wood* only because it is potentially something which is an individual in its own right—namely, *this box*. Further, the idea that the matter lacks an identity in its own right is confirmed by Aristotle's discussion at *Θ*7, $1049^{a}27–36$, of the contrast between predications in which the subject is an identifiable individual ('a particular this' ($1047^{a}28–9$, 34–6)) and predications in which it is not (see also the discussion of the present passage at Burnyeat 1984: 131–2).

Aristotle makes reference to the *en*-idiom elsewhere, at *Phys.* 7.3, $245^{b}9–16/245^{b}26–246^{a}2$, and at *Met. Z*7, $1033^{a}5–23$. In both cases the material is difficult. The reference at *Phys.* 7.3 is in the context of an argument concerning alteration, intended to show either that there is a difference between alteration and coming-into-being (in the α version of *Phys.* 7, $246^{a}1–4$) or that alteration occurs only in respect of perceptible properties (in the β version, $246^{a}24–5$). For discussion of those arguments, see Wardy (1990: 180–209). The argument at *Met. Z*7, $1033^{a}5–23$, also admits of different interpretations (see Burnyeat 1979: 61–2, and Bostock 1994: 127–9 for alternatives). But it is noteworthy that, on one reading of *Met. Z*7, $1033^{a}5–23$, use of the *en*-idiom marks a dim awareness that our linguistic resources are *in*adequate to reflect the correct metaphysics. Aristotle's argument, according to this interpretation, is as follows. There are three factors involved in a change: an initial privation, an underlying subject, and an end result. In describing a change it is more proper to say that the end result *comes from* the privation than to say that it comes from the underlying subject: for example, we should say that the man comes to be healthy

from being sick (the privation) rather than *from* being a man (the underlying subject). And, if our language provides a way of referring to the privation, that is what we *do* say: there is a term *sick* which refers to the privation of health, and we use that term in describing someone's becoming healthy. In some cases, though, there is no term available to refer to the privation: for example, when we want to describe the change which issues in a box, natural language provides no single term for non-boxes. Consequently there is pressure to say that the box comes *from* the underlying subject—for example, from the wood. But we do not want to say that the product of a change *is* what the product comes *from*: for example, the man becomes healthy *from* being sick, and we do not say that the healthy man *is* sick. The *en*-idiom provides a way of respecting this constraint, even in cases where the paucity of language forces us to say that the end product (for example, the box) comes *from* the underlying subject (the wood). For even in these cases we will not say that the box *is* wood, but rather that it is wood*en*. If this is the correct way of taking *Met.* *Z*7, 1033^{a}5–23, then Aristotle draws very different morals in *Met.* *Z*7, 1033^{a}5–23, and in the present passage from the *en*-idiom. In *Met.* *Z*7 it compensates for an inadequacy of language, while in *Met.* *Θ*7 it reflects the correct metaphysics of potentiality.

9. 1049^{a}24–1049^{b}2: Two Corollaries

Aristotle ends the chapter with two points. One draws out a consequence of the *en*-idiom (1049^{a}24–7); the second confirms that the locution is appropriate (1049^{a}27–1049^{b}2).

The first point is fairly straightforward. Aristotle has introduced the idea of a series (for example, box–wood–earth), each member of which is immediate matter of the preceding member. We say of some item F that it is G-*en* when G stands immediately below F in such a series. It follows then that, if there is some item F for which there is no G such that we say F is G-*en*, then F is the lowest member of the series. Further, lower members of the series stand as matter to higher members (as immediate matter to the immediately preceding member, and as mediate matter to members further up the series). It also follows, therefore, that the lowest member of a series would be (immediate or mediate) matter to every other item in that series: and so would appropriately be called the *primary matter* for that series (1049^{a}27). The passage

is best taken as making a point about the logical structure of such a series, rather than as declaring a positive view on whether there is primary matter. It opens with a conditional (1049^a24: *if* there is something primary . . .), and the examples (earth, air, fire) are purely illustrative.

The second point is more complicated. Aristotle contrasts two types of predication. In each case there is a subject (1049^a28) and something predicated (1049^a35). The contrast turns on whether the subject is an identifiable individual ($1049^a27–9$).

(A) The subject is an identifiable individual: for example, a particular human being ($1049^a29–30$) which is a substance (1049^a34). What is predicated of that individual substance is an affection (1049^a30, 1049^b1): that is, an accidental property in some non-substantial category ($1049^a30–3$).

For example, a quality such as pallor, or a change, is predicated of the human being Candy.

(B) The subject is not an identifiable individual, but matter ($1049^a35–6$); what is predicated of the subject is a form (1049^a35).

This is the more difficult case, and it is harder to decide on clear examples. It seems that in this case the upshot of the predication is an individual (quasi) substance: for example, an individual box, an individual statue, an individual human being. The subject is the matter composing that substance (the wood, the bronze, the flesh and bones: the type of item Aristotle refers to as *this wood* at 1049^a24); what is predicated is a property such as being-a-box, being-a-statue, being-human.

The idea (B) that an individual substance can be analysed into a substantial form predicated of the matter which composes that substance is mentioned by Aristotle elsewhere (especially *Met.* *Z*3, $1029^a23–4$; *Z*13, $1038^b5–6$; *H*2, $1043^a5–6$). But it generates serious tensions within Aristotle's metaphysics of substance: if matter stands to a substantial form as an individual substance stands to its accidental properties, then it is hard to see why the individual substance (for example, the particular human being) should be ontologically privileged. These are precisely the tensions which are supposed to be reduced by the suggestion in *Met.* *H*6 that the relation of matter to substantial form should be assimilated to that of potentiality to actuality (*H*6, $1045^a23–5$, $1045^b16–23$). And *Met.* *Θ*

clarifies the concepts to which *H*6 appeals (recall Introduction, §6). So the present passage is difficult in part because it raises directly some of the global issues with which *Θ* is concerned: the matter–substance relation as an instance of the potentiality–actuality schema. But there is no reason to expect these global issues to be resolved here: they are the subject matter of *Met. Θ* as a whole.

Another difficulty concerns Aristotle's reason for contrasting the two types of predication (A) and (B). His aim is to confirm that it is appropriate, for example, to call a box wood*en* rather than wood (1049^a36–1049^b2). How does the contrast between (A) and (B) contribute to that aim?

Both types of predication involve a change in word endings. But there is a striking difference between them. In the first type of predication (A) it is the ending of the *predicate term* which is altered: for example, we predicate *change* of the subject Candy, but we say 'Candy is chang*ing*' (1049^a30–4). But, as Aristotle has pointed out (1049^a18–24), in the second type of predication (B) it is the ending of the *subject term* which is altered (that is, the ending of the term which picks out the matter): for example, we predicate being-a-box of the subject *wood*, but we say 'the box is wood*en*' (1049^a19–20, 34–6). If that difference is inexplicable, we should be less confident that these changes of word endings reveal anything of metaphysical significance. It will seem arbitrary that they attach to the predicate term in one case, and the subject term in the other.

Aristotle's view is that the difference is not arbitrary. In both cases the change of word ending tracks what is indefinite (1049^a36–1049^b2): in case (A) the affection indicated by the predicate term (for example, pallor), in case (B) the matter indicated by the subject term (for example, wood). What is indefinite is to be contrasted with what is particular and individual: in case (A) what is indicated by the subject term (for example, Candy), in case (B) what corresponds to the predicate term (for example, the human form). The contrast shows up well in connection with *counting*. What is indefinite cannot be counted; counting requires identifiable individuals.

In case (A) it is properties, corresponding to predicate terms, which cannot be counted. The question 'how many pallors are there in the room?' is unanswerable. The particulars, corresponding to the subject term, can be counted: 'how many humans in the room?' is straightforward. The properties can be counted only relative to the

particulars of which they are predicated, at which point the change of ending shows up: 'how many *pale* humans are there in the room?'

In case (B) it is matter, corresponding to subject terms, which cannot be counted: there is no answer to 'how many woods are there in the cupboard?' It is the form, corresponding to the predicate term, which secures something countable and particular: 'how many boxes in the cupboard?' is fine. The matter can be counted only relative to a form which fixes its identity, and again at that point the change of ending shows up: we ask 'how many wood*en* boxes are there in the cupboard?'

This confirms a point noted earlier (§6(ii) above). A consequence of Aristotle's account of what it is to be potentially F (1049^{a}5–18) is that the identity of some matter as potentially F depends on its being suitable for transformation into an actual F. We cannot pick out an arbitrary parcel of matter (*that stuff*) and suppose that it has an identity in its own right, as matter (1049^{b}1–2: as matter it is indefinite). A parcel of matter has an identity only as the matter for a particular F (1049^{a}9–11: it is exactly what can be transformed by an exercise of the appropriate capacity into an F), or the matter composing a particular F (1049^{a}24: this-wood is just what composes this-box; 1049^{a}34–6: the particular individuality is due to the predicated form).

CHAPTER 8

1. An Overview of the Chapter

The purpose of this chapter is to establish that actuality is prior to potentiality (1049^b5). Three different types of priority are considered in turn.

First ($1049^b12–17$) Aristotle briefly explains that actuality is prior *in account* to potentiality. Second ($1049^b17–1050^a3$), he considers priority *in time* and offers a more qualified position: actuality in one way is, and in another way is not, temporally prior to potentiality ($1049^b11–12$). Third, and at greatest length ($1050^a4–1051^a2$), he argues that actuality is prior *in substance* to potentiality. This last discussion itself falls into two parts: first ($1050^a4–1050^b6$) he presents a number of arguments to show that actuality is prior in substance to potentiality, and then ($1050^b6–1051^a2$) considers a 'more proper' way in which actuality is prior in substance.

The conclusion that actuality is prior in substance to potentiality is one of the main results of *Met.* Θ. The first part of the discussion ($1050^a4–1050^b6$) is intended to apply to both of the relations which were brought under the potential–actual schema in Θ6. Aristotle argues case by case for his conclusions concerning the change–capacity relation ($1050^a10–14$: the exercise of a capacity is prior to its possession; $1050^a23–1050^b2$: the exercise of a capacity is prior to the capacity itself) and concerning the matter–substance relation ($1050^a5–10$: a mature specimen of a kind is prior to an immature specimen; $1050^a15–23$: substance is prior to pre-existing matter).

The move to the second part of the discussion ($1050^b6–1051^a2$) brings a third relation under the potential–actual schema: the relation of eternal to perishable things ($1050^b6–8$). This instance of the potential–actual schema differs in a very significant respect from the others: the items on each side of the dichotomy are entirely distinct from one another. A capacity gives rise to a change in the right circumstances; matter can be turned into, and composes, a substance. But perishable things do not give rise to, turn into, or become eternal things ($1050^b28–34$ mentions a more opaque relation: perishable things *imitate* eternal things). This part of the discussion is therefore unlikely to cast light on the ideas underlying

*Met. H*6. The final part of *Θ*8 instead points forward to the way in which the potentiality–actuality schema features in the sort of project pursued in the later chapters of *Met. Λ* (see Introduction, §7).

2. 1049^{b}4–12: Three Types of Priority

Aristotle distinguishes different types of priority in a number of places. The obvious reference for 1049^{b}4–5 is *Met. Δ*11, which includes an extended but complex treatment of priority in substance (*Δ*11, 1019^{a}2–14; see §§6–9 below and Makin 2003 for details). However, *Δ*11 does not distinguish all and only the three types of priority treated in *Θ*8. *Met. Z*1, 1028^{a}31–1028^{b}2, does specify three types of priority, and says that substance is prior in all three ways. Two of the *Z*1 types correspond to *Θ*8 (priority in account and priority in time: although the gloss at *Z*1, 1028^{a}33–4, that substance is prior in time because only substance is separable, does not align with *Θ*8). Both *Z*1 and *Δ*11 mention priority in knowledge. That type of priority does not appear in the summary at *Θ*8, 1049^{b}10–12, but 1049^{b}16–17 refers to knowledge in connection with priority in account. Aristotle also treats priority at *Cat.* 12, 13. For an extended study of Aristotle's discussions of priority, see Cleary (1988).

The conclusion about priority is intended very generally. The focus is on the three relations falling under the potential–actual schema (change–capacity, substance–matter, eternal–perishable). But at 1049^{b}5–10 Aristotle is also careful to say that potentiality as an origin of change incorporates both other directed capacities (the main topic of *Θ*1–5) and self-directed natures; the point is repeated at the end of the chapter (1051^{a}3). There was the same breadth in *Θ*7 (1049^{a}5–12: rational and non-rational capacities; 1049^{a}13–17: natures). For more on the distinction between capacities and natures, see Introduction, §5.

3. 1049^{b}12–17: Priority in Account

Actuality is prior to potentiality in account. Of the three priority claims in *Θ*8, this receives the least attention both from Aristotle and from subsequent commentators. The text falls into three sections:

(i) 1049^{b}12–13: a statement of the priority claim: actuality is prior in account to the correlative potentiality.

(ii) 1049^{b}13–16: examples, followed by a generalization (1049^{b}16), in support of (i).
(iii) 1049^{b}16–17: a claim about precedence: knowledge of actuality precedes knowledge of the correlative potentiality.

Sections (i) and (ii) are relatively straightforward, although the significance of *primarily* at 1049^{b}13–14 is unclear. It is unlikely to refer to the focal definition of an active capacity for change at *Θ*1, 1046^{a}10–11, since the examples which follow are not limited to active capacities. More probable references are to 'potentiality most properly so called' in the programmatic section at *Θ*1, 1045^{b}35–6; or to capacities for change concerning *other things* as distinguished from *self-directed natures* at *Θ*8, 1049^{b}6–7.

According to (i) and (ii), actuality is prior in account because in defining a capacity we refer to its exercise, whereas the converse is not the case. I explain what it is to be sighted or visible in terms of seeing or being seen (to be sighted is to be capable of seeing, to be visible is to be capable of being seen); I do not explain what it is to see or to be seen by reference to a capacity. All Aristotle's illustrations concern capacities and their exercise. But it would be easy to provide examples to cover a broader range of cases: we define grain as wheat seed, whereas we do not define the mature wheat as sprouted grain (compare *Θ*8, 1050^{a}5–6).

Section (iii) is more difficult. First: is it a claim about logical precedence (knowledge of actuality is presupposed by knowledge of potentiality), or about temporal precedence (knowledge of actuality is possessed earlier than knowledge of potentiality)? Second: is it a claim about recognition (knowledge/recognition that Candy is building precedes knowledge/recognition that she is a builder) or about understanding (knowledge/understanding of what building is precedes knowledge/understanding of what skill in building is)? (Compare *Met.* *Δ*11, 1018^{b}30–7, which distinguishes within cases of priority in knowledge between what is prior in account and what is prior in perception.) And third: does (iii) expand on or merely repeat (i) and (ii)?

Aristotle's examples at 1049^{b}14–15 are well chosen. But other examples make Aristotle's priority claim more controversial. It seems there are capacities which satisfy the condition:

[EX] A is ϕ-ing only if what A does is an exercise of the capacity to ϕ.

For example (a rational capacity), Candy utters the correct answer to a mathematical problem: has she solved the problem, or made a lucky guess? She has solved the problem only if her uttering the answer is the exercise of a general mathematical ability: only if her utterance manifests the capacity which is mathematical knowledge, and is the result of appreciating the significance of various pieces of information, making appropriate deductions, and so on. Or (a non-rational capacity), suppose a tree's leaves drop off: whether the tree is *shedding its leaves*, rather than being affected by pollution, depends in part on whether the leaves' dropping off is an exercise of the leaf-shedding capacity characteristic of deciduous trees.

However, not every capacity satisfies [EX]. I touch my nose with my foot so long as I get my foot in contact with my nose. Doing so need not be the exercise of any general acrobatic capacity. It may be a lucky success. I may never again manage to repeat the trick. Nevertheless, what I managed to do as a one-off was indeed *touch my nose with my foot*.

There are a number of interesting issues raised by [EX]. For example, it is a delicate matter to state clearly the relation between [EX] and one of the conditions mentioned in discussion of the preceding chapter (Commentary, Chapter 7, §7(iii)):

[GAIN] A gains the capacity to ϕ as a consequence of having ϕ-ed.

Capacities which are acquired by practice satisfy [GAIN]. And many capacities which satisfy [EX] *are* acquired through practice—that is how people acquire mathematical knowledge, or the abilities to read or solve crimes. But it is prima facie impossible for a single capacity to satisfy both [EX] and [GAIN]. According to [GAIN], an agent has to ϕ in order to acquire the capacity, while, according to [EX], the agent is ϕ-ing only if she is exercising (and therefore already possess) the capacity. This is a difficult issue, although it is plain that it engages Aristotle's interest—for example, it is relevant to his discussion later in *Θ*8 of the sophistical argument about capacity acquisition ($1049^{b}29–1050^{a}3$; see §5 below; see also *EN* 2.4, and recall Commentary, Chapter 5, §2). The present point, however, is just that capacities which satisfy [EX] are prima facie counter-examples to Aristotle's claim about priority in account. It does not seem true that a capacity satisfying [EX] can be defined in terms of the type of action which would be its exercise. On the contrary, I explain, for example, what it is for a certain type of action

to be the solving of a mathematical problem by reference to an underlying capacity which the action manifests. However, I will not pursue the questions raised by [EX] any further at present.

4. 1049^{b}17–1050^{a}3: Priority in Time

Actuality in one way is, and in another way is not, temporally prior to potentiality (1049^{b}11–12).

Temporal priority is the most clearly defined of the various types of priority considered by Aristotle in this chapter. According to *Cat.* 12, temporal priority is the most proper type of priority (14^{a}26–7); Aristotle there sees no need to explain what the notion comes to. The treatment of temporal priority at *Met.* Δ11 is similarly perfunctory (1018^{b}14–19: the main point added to the *Cat.* 12 treatment is that whether A's being temporally prior to B implies that A is nearer to the *present* than B depends on whether A and B are in the past or in the future). Since temporal priority is such a basic type of priority, Aristotle often includes a reference to temporal priority when discussing the various ways in which one item is prior to another, even when this leads to obscurity (for example, *Met.* Z1, 1028^{a}32–4: the claim that substance is primary in time is extremely opaque). Similarly in the present passage: it is unclear what substantive point Aristotle's discussion of temporal priority establishes.

It is fairly easy to appreciate the way in which what is *potentially* F is temporally prior (1049^{b}19–23). Consider an individual entity which develops towards being actually F (for example, actually seeing, or being actually human (1049^{b}19–20)). Something potentially F existed earlier: in some cases the same entity, in other cases not. Before Candy was actually seeing, *Candy* was potentially seeing; in contrast, Candy herself is not potentially human before being actually human (compare Θ7, 1048^{b}37–1049^{a}18, 1049^{a}34–6, on the issues raised by such cases).

The respect in which what is *actually* F is temporally prior follows from Aristotle's account of natural generation (1049^{b}18–19, 23–9). Two related claims are in play. One is a general principle, not itself formulated in terms of the potential–actual distinction (1049^{b}27–9: the back reference 'it was said in the discussions about substance' is to *Met.* Z7–9, e.g. 1032^{a}13–14, 1033^{a}24–8):

[A] Everything which comes to be comes to be something *from something* and *by means of something*.

The other claim, stated a little earlier, results from imposing the potential–actual distinction on [A] ($1049^{b}24–5$):

[B] What is actually (F) comes to be *from* what is potentially (F) *by means of* what is actually (F).

[B] identifies two items relevant to the coming-to-be of something which is actually F. Aristotle gives an example of each ($1049^{b}25–6$). A man comes *from* (what is potentially) a man; the process which results in this actual man starts with something which is potentially a man (compare *Θ*7, $1048^{b}37–1049^{a}18$). And a musician comes about *by means of* (what is actually a) musician; someone who is actually a trained musician is the agent by means of whose teaching a potential musician becomes an expert.

Aristotle uses [B] to show that, given any item which is potentially F, something exists earlier which is actually F. But [B] seems ill-suited for establishing any very significant conclusion about temporal priority. Let us grant that, for an item which is potentially F, there exists earlier some item which is actually F (for example, an actual human being preceding something which is potentially human; an actual musician preceding this potential musician). But it is equally the case according to [B] that that actual F was itself preceded by something potentially F—namely, the potentially F item *from which* the actual F came about. No doubt, of course, there was a further actual F preceding that potentially F item, but then equally there was something potentially F preceding that further actual F, and so on.

This result is not surprising. [B] generates a chain of items which are actually F preceded by items which are potentially F preceded by items which are actually F preceded by ..., stretching back infinitely into the past. There is no good reason to attribute any purely *temporal* priority to the actually F items rather than to the potentially F items. For the purely *temporal* relations between the actual Fs and the potentially F items in the chain are symmetrical (actual Fs preceding anything which is potentially F; and things which are potentially F preceding any actual F). But any significant priority relation is asymmetrical (if A is prior to B then B had better not be in the same way prior to A).

Of course there may be some other *non-temporal* type of priority in terms of which the actual Fs in that infinite temporal chain could be privileged over the potentially F items. For example, the actual Fs are privileged in that they are the causally significant items: what

is already actually F is the changer or producer of what follows it ($1049^{b}27$). This point is picked up later at $1050^{b}4$–6, which should be taken as directing attention to whatever item, in the case of a particular change, produces *that* change (see further §9 below). Aristotle's remark at $1050^{b}4$–6 is unlikely to be about the Prime Mover of *Met.* Λ6–7: the back reference ('and as we said') at $1050^{b}4$ is presumably to $1049^{b}17$–29, which does not mention the Prime Mover. For the terminology of first changer (for example, a doctor, or her medical skill) and last changer (for example, the food or medicine administered), see *GC* 1.7, $324^{a}24$–$324^{b}4$.

Aristotle's strategy concerning temporal priority in *Θ*8 is paralleled in *Phys.* 8.7. He argues there that locomotion is the primary type of change (*Phys.* 8.7, $260^{a}26$–29, $261^{a}27$–8). There are different types of primacy, one of which is temporal primacy ($260^{b}16$–19); and Aristotle argues that locomotion, as well as being primary in other ways, is also *temporally* primary ($260^{b}29$). His argument for that claim is extremely brief ($260^{b}29$–30: locomotion is the only type of change which is possible for eternal things). But then he addresses a problem. If we consider a particular generated item, then locomotion will be the latest type of change to which *it* is prone ($260^{a}30$–4: a particular human, for example, will have altered and grown *before* it moves about). How then can locomotion be the temporally primary type of change? Aristotle's answer is that there must have been something else earlier which generated *this* item, and which underwent locomotion ($261^{a}1$–2). Aristotle's argument then becomes more complex as he turns to the relation between locomotion and becoming ($261^{a}2$–12), but the strategic parallel with *Met.* *Θ*8, $1049^{b}17$–$1050^{a}3$, is apparent at this stage.

5. $1049^{b}29$–$1050^{a}3$: Capacity Acquisition

Aristotle has pointed out earlier in *Met.* *Θ* that some capacities are acquired through practice (*Θ*5, $1047^{b}31$–5, specifies capacities acquired through habituation (such as flute playing) and through learning (such as building); see Commentary, Chapter 5, §2). He now returns to the topic. The discussion falls into three parts. First ($1049^{b}29$–32) he states his view that some capacities are acquired by practice; second ($1049^{b}33$–4) he reports a sophistical argument concerning capacity acquisition; third ($1049^{b}35$–$1050^{a}2$) he offers a response to that argument.

Why does Aristotle provide an outline account of capacity acquisition here? The opening connective (1049^{b}29: 'that is why ...') shows that it is intended to support earlier points about temporal priority (see also 1050^{a}2–3). But precisely how does it do so? There are two possible approaches:

(i) The material illustrates, and thereby supports, the immediately preceding principles (1049^{b}27–9, 1049^{b}24–5)

[A] everything which comes to be comes to be something from something and by means of something

and

[B] what is actually (F) comes to be from what is potentially (F) by means of what is actually (F).

(ii) The discussion of capacity acquisition is intended to provide further and direct support for the general moral of 1049^{b}23–9, that actuality is prior in time to potentiality. The qualification, that potentiality is also in a way temporally prior to actuality, is by this point no longer the object of Aristotle's attention. The general principles [A] and [B] are not in the picture.

A point in favour of (i) is that [A] and [B] have a consequence which clearly is relevant to issues about capacity acquisition: namely, that, if Candy is learning to become a builder, then some *actual* building expert must already exist *by means of* whom Candy will become fully trained (the example at 1049^{b}26, 'musician by means of musician', immediately suggests that a student requires an expert to act as teacher). Further, that consequence illustrates, and thereby supports, the temporal precedence of actuality over potentiality. On approach (i) the relevant actuality is the trained expert builder; the relevant potentiality is the apprentice; the actuality is temporally prior in that for each apprentice there must already exist some expert who is her teacher (compare *An.* 2.5, 417^{b}12–16: a student knows potentially, and is taught by someone who knows actually).

However, the conclusion that a student builder needs a *teacher* is not overly relevant to the argument which follows in 1049^{b}29–1050^{a}3, since the main point there is that a student builder needs to *practise building*. The teacher-requirement and the practice-requirement are not equivalent, since there can be cases of skill

acquisition which satisfy one but not the other. If I am to become an expert bomb-defuser, I need a *teacher* who can tell me the various ways in which bombs are made, but I may not need to *practise*—my training is rather a matter of finding out what to do. In contrast, if I am to become an expert juggler, I need to *practise* tossing the balls, but I do not need a *teacher*—I know what needs doing, and my training is a matter of developing some facility in doing it. Aristotle's concern in the present passage is with the need for practice, rather than with the need for a teacher. He cites as an accepted fact that in lots of cases someone learns to ϕ by ϕ-ing ($1049^b31–2$: stated for harp playing and then generalized), from which it follows that it will be impossible to be an expert ϕ-er if one has never ϕ-ed ($1049^b29–31$). And that constitutes direct confirmation of the claim that actuality is temporally prior to potentiality. On approach (ii) the relevant actualities are instances of building; the relevant potentiality is the expert's capacity to build; actuality is temporally prior in that someone must have engaged in acts of building before acquiring, through such practice, a capacity to build. Approach (ii) is decisively recommended by the fact that it emphasizes the need for *practice*, which is the main focus of $1049^b29–1050^a3$.

Having stated his own position ($1049^b29–32$), Aristotle reports an argument against the possibility of acquiring capacities through practice ($1049^b33–4$). He describes the argument disparagingly as a sophistical puzzle, although elsewhere he shows himself genuinely worried by the apparently paradoxical air of his own account of capacity acquisition (*EN* 2.4). The argument presented here is straightforward. Possessing a craft capacity is a matter of having a certain type of knowledge. And it may seem irresistible to say, for example, that building skill is knowledge of how to build. But, in that case, a trainee who is practising will be building, although she does not know how to build.

Aristotle's reply calls for comment ($1049^b35–1050^a2$). The sophistical argument rests on an assumption about knowledge:

[KA] It is not possible for someone to ϕ if she does not know how to ϕ.

There are two ways of dealing with this assumption. One can reject it. Or one can accept it but argue that it does not generate any objectionable conclusion. In *EN* 2.4 Aristotle adopts the former strategy. He there draws a distinction between, for example, doing

something grammatical or temperate, and doing it grammatically or as a temperate person would (*EN* 2.4, 1105^{a}22–6, 1105^{b}5–9). The crucial point is that I can do something grammatical (for example, construct a complex sentence correctly) by luck, or through following the instructions of a teacher; and so I do not myself require any grammatical knowledge in order to write grammatical sentences. In contrast, the expert grammarian not only writes grammatical sentences, but does so on the basis of her own knowledge of grammar (that is, grammatically: 1105^{a}24–5). That *EN* 2.4 response is a rejection of [KA]: it comes to saying that it *is* possible to ϕ (though not to do so *expertly*) without knowledge of how to ϕ.

However, his strategy in the present passage is different. He appeals to a view defended in *Phys.* 6.6, that whatever is undergoing change has already undergone change, which, when applied to the case of existential change, yields the claim that, if something is coming into existence, then some part of it has already come into existence (*Phys.* 6.6, 237^{b}9–13; see also Commentary, Chapter 6, §6). When an apprentice builder is learning through practice, the building craft is coming into existence in her, and so at any stage in her learning some part of the craft must already have come into existence (1050^{a}1–2). This strategy does not involve denial of [KA]. Instead, the threatening conclusion is avoided by claiming that at every stage of her acquisition of building skill through practice, the apprentice already possesses some part of the building knowledge.

It is not immediately clear how we should understand Aristotle's idea that the student possesses *something* of the knowledge that is building skill. Aristotle's hesitant *perhaps* at 1050^{a}1 suggests that he too sees this merely as a sketch of a response to the sophistical puzzle. Consequently it is not clear whether this is a preferable strategy to that adopted in *EN* 2.4. Aristotle's strategy in *Met. Θ*8 embodies a strong intuition which deserves to be retained: that expertise is acquired by degrees (although this intuition is not closely connected to the crucial premiss in the *Phys.* 6.6 arguments, that magnitudes are infinitely divisible (237^{b}7–9, 20–1)). But it is less obvious how the notion of acquiring a body of knowledge by degrees should be understood. One option is that the student gradually acquires more and more of the *content* of that body of knowledge which the expert possesses in its entirety: for example, the student first learns how to mix cement, then how to lay bricks, then how to construct a damp course, and so on. The second option

is that the student's gradual acquisition of the skill is a matter of an increasingly secure *grasp* of something which the expert has assimilated fully.

If Aristotle is thinking along the first line, in terms of the serial acquisition of the *content* of craft knowledge, then he is making a claim about craft capacities which is very plausible, but which does not constitute a good response to the sophistical argument. The plausible claim is that a genuine craft, as opposed to a mere knack, will be a *complex* body of knowledge: it will enable its practitioner to respond appropriately to a wide range of conditions, and so will involve sub-competencies. Acquisition of the craft will involve the serial acquisition of those sub-competencies, since the student will have to learn how to adjust the performance of each sub-competence in order to achieve the overall goal of the craft (for example, how to lay different foundations in different soil conditions, in order to obtain walls which will support a roof, in order to get shelter). But that plausible claim is ill-suited for grounding a reply to the sophistical puzzle, since the problem now shifts from the acquisition of the craft as a whole to the acquisition of each sub-competence. The student's acquisition of the sub-ability to lay foundations will itself involve practice; there is no reason to suppose that *every* sub-competence is itself composed of further sub-competencies; and so we will have to allow, for example, that the student will lay foundations when practising without knowing how to lay foundations.

The second option, that Aristotle is thinking of an increasingly secure *grasp* of a body of knowledge, promises a better response to the sophistical argument, although it is intrinsically less plausible. The absolute beginner presumably has *no* grasp of the relevant body of knowledge (either as a whole or of its constituent sub-competencies).

Perhaps the thought is that there is *some* grasp involved in every practice attempt at the craft (so that even the apprentice builder on her very first shot at brick laying manifests *some* degree of knowledge). In that case it will be possible to evade the sophistical puzzle without rejecting [KA]: there just never will be anyone who ϕ's, however haltingly, who does not thereby display *some* degree of knowledge of how to ϕ. But that is an implausible thought, and the line taken in *EN* 2.4 is far more appealing: that in the early stages of learning the apprentice acts without knowledge, but gets it right by luck or by following instructions. And, once it is allowed that

there are *any* initial stages of practice at which the apprentice acts without any degree of knowledge, then [KA] is in effect denied; and the strategy of *Met.* Θ8, $1049^{b}29–1050^{a}3$, has been abandoned in favour of that adopted in *EN* 2.4.

6. $1050^{a}4–10$: Priority in Substance, Generation, and Teleology

It was fairly clear what was meant by priority in account and in time. This is not the case as regards priority in substance: the notion calls for considerable explication, not least in order to reveal how items which are not substances—such as changes and capacities—can be prior or posterior in substance to one another.

In *Met.* Δ11 Aristotle explains priority in nature and substance in terms of existential independence: Fs are prior in substance to Gs so long as there can be Fs without Gs, but not vice versa (Δ11, $1019^{a}1–14$, especially $1019^{a}1–4$). However, in spite of the statement in Δ11 the notion of priority in substance remains unclear:

(*a*) There is textual evidence which conflicts with the *Met.* Δ11 account. *Cat.* 12, $14^{a}29–35$ and $14^{b}10–22$, explain priority in nature in causal terms; *Phys.* 8.7, $260^{b}16–19$, contrasts priority in substance and existential independence.

(*b*) The *Met.* Δ11 passage does not merely state the criterion of existential independence, but also refines it in light of the point that 'being is said in many ways' ($1019^{a}4–14$). As a result the criterion is more complex than it at first sight appears.

(*c*) The existential independence criterion is hard to fit with examples at *Met.* Θ8, $1050^{a}5–7$: an adult as prior in substance to a child and a human being to a seed or fertilized egg. An individual child *can* exist without ever becoming an adult (see Witt 1994). And, while it is true that human children could not exist without some adults existing (to serve as parents), it is equally true that human adults could not exist without some human children existing (every adult was a child once)

A more refined statement of the existential independence criterion, using some of the Δ11 qualifications, accommodates Aristotle's examples and fits well with the overall structure of Aristotle's discussion of priority in substance in Θ8. For a fuller treatment of these issues see Makin (2003).

On this interpretation priority in substance is indeed fundamentally a matter of existential independence: Fs are prior in substance to Gs if it is possible for there to be Fs without Gs, but not vice versa (*Met.* Δ11, 1019^{a}2–4). But application of the criterion to the changeable world is not straightforward. Adults and children come into and go out of existence, capacities are and are not exercised, for all sorts of reasons. Things can go wrong, and children die young. Unfavourable conditions can prevent a capacity being exercised. We need to focus on a privileged type of existential independence, which takes these complexities into account.

In order to establish a conclusion about priority in substance we have to think about possibilities—whether it is *possible* for there to be Fs without Gs or not. But possibility is a complex notion, and there are different types of possibility (recall Commentary, Chapter 3, §9, on the Additional Adjustments problem). Often I establish whether something is possible, given a certain set of conditions, by considering whether there is a consistent way of its coming about given those conditions. In such cases we may need to qualify the way in which an outcome is possible by specifying the sort of route by which the outcome becomes actual; and in the absence of such a specification there may be no determinate answer to the question whether or not the outcome is possible, even given a particular set of background conditions. There is a large boulder in Candy's garden, she is able bodied, there are planks present. Is it possible that she move the boulder? If she builds a lever, then it is coherent to suppose that she actually move the boulder; if she simply strains at it unaided, then it is not coherent. It is possible *by leverage* for her to move the boulder; it is not possible *unaided*.

Aristotle's distinction at *Met.* Δ11, 1019^{a}12–14, between what can exist independently *in respect of generation* and *in respect of destruction*, is an instance of this sort of qualification of possibility. If generation results in Fs rather than Gs, then it is possible in respect of generation for there to be Fs without Gs; while, if destruction results in Gs rather than Fs, then it is possible in respect of destruction for there to be Gs without Fs. (Aristotle gives an example at Δ11, 1019^{a}12–14, but it is very schematic: the whole can exist without the parts in respect of generation, the parts without the whole in respect of destruction.) According to *Met.* Θ8, 1050^{a}5–6, an adult is prior in substance to a child. Is there any respect in which there can be adults without children, but

not children without adults? Yes: *in respect of generation*. Human generation is an extended process, the successful upshot of which is an adult human being, not a child. Of course, there are also processes which result in children, and not adults: for example, infanticide, childhood illness. These are processes not of generation, but of destruction. So it is possible, *in respect of destruction*, for there to be children without adults and not adults without children. But there is a crucial difference between these processes, between generation and destruction. The destructive process is an interruption of, or interference with, the generative process; the converse is not the case. If human generation runs its course, the upshot is adults rather than children; in order to get children rather than adults, I have to interfere with or interrupt that process.

Now Aristotle emphasizes teleological notions throughout the first part of *Θ*8's discussion of priority in substance ($1050^{a}4$–$1050^{b}6$). A good deal of argument is devoted to persuading us that it is appropriate to view both the capacity–change and the matter–substance relations teleologically. An animal possesses sight for the sake of seeing ($1050^{a}10$–14); a capacity is for the sake of its exercise, even when there is a further result beyond the exercise at which the capacity aims ($1050^{a}23$–$1050^{b}2$). An adult human is the goal towards which a fertilized egg and a child develop ($1050^{a}5$–10). The acquisition of form by matter is a transformation aimed at the substance which results ($1050^{a}15$–23). There may even be a teleological residue behind the obscure comment that perishable things imitate eternal things ($1050^{b}28$–30), although teleology is not really relevant to discussion of the eternal–perishable relation ($1050^{b}6$–$1051^{a}2$). Why does teleology have such a central place in Aristotle's arguments about priority in substance? The reason is that, if it is appropriate to view a relation teleologically, it is therefore also appropriate to apply other notions: interference, interruption, hindrance, and a normal outcome. It makes sense to talk of a teleological process being interrupted (compare *Phys.* 2.8, $199^{a}33$–$199^{b}7$). That is because a teleological process has a privileged stage to which it runs in normal conditions, unless interfered with or hindered: the goal to which it is directed. These notions do not apply to non-teleological processes. Water drips from the trees without purpose. Sometimes dripping leads to a large pool, sometimes to damp ground, sometimes it just stops: we do not differentiate among those outcomes between those which are normal and unhindered and those which are interrupted.

The lesson of *Met.* Δ11, 1019^{a}1–14, is that it is the notions of a normal outcome, interference, interruption, and hindrance, which are crucial for understanding what Aristotle means by priority in substance. Fs are prior in substance to Gs so long as it is possible *in a certain respect* for there to be Fs without Gs, but not vice versa. In what respect? In respect of some process of which the normal outcome is Fs rather than Gs. This refined criterion of existential independence can be summarized:

[RE] Fs are prior in substance to Gs so long as there is some process which in *normal* conditions results in Fs rather than Gs; whereas the way to get Gs rather than Fs is to *interfere with*, *interrupt*, or *hinder* that process.

The examples at 1050^{a}5–7 now fall into place. Aristotle often says that the results of generation are prior in substance to the earlier stages (1050^{a}4–5: compare *Phys.* 8.7, 261^{a}13–14; *Phys.* 8.9, 265^{a}22–4; *GA* 2.6, 742^{a}19–22; *Met.* *A*8, 989^{a}15–18; *Rhet.* 2.19, 1392^{a}19–22). Generation is a process from a potential F (for example, a seed) to an actual F (for example, a human being), and brought about by an actual F (for example, the parent human being). Aristotle views the process teleologically. The actual F is the goal or end of the process (1050^{a}7–8); the process is for the sake of that actual F (1050^{a}8–9); and the upshot of generation is that something fully acquires the relevant form (1050^{a}6–7). Adults are prior in substance to children because generation normally results in adults rather than children. A process which resulted in children rather than adults would not be a process of generation, but rather an interrupted or incomplete generative process, a kind of destruction.

The discussion at 1050^{a}4–10 applies [RE] to one instance of the potential–actual schema: mature and immature specimens of a kind. Adults are prior in substance to children because *generation* is a process which in normal conditions results in adults rather than children. However, Aristotle is after a general conclusion (1049^{b}5, 10–12, 1051^{a}2–3). And so he considers other instances of the potential–actual schema (1050^{a}10–14, 1050^{a}23–1050^{b}2: exercise–capacity; 1050^{a}15–23: matter–substance; 1050^{b}6–1051^{a}2: eternal–perishable). Generation is not relevant in those cases. But the notions of normal conditions, and absence of hindrance, which are central to [RE], are

applied to the capacity–exercise and matter–substance relations on the basis of material from *Θ*2, 5 and 7 (see §§7–9 below).

On the other hand, when he turns to the eternal–perishable relation at 1050^{b}6, the refinements built into [RE] are not required. Eternal things do not go out of existence. So the relation between the eternal and perishable is stable and cannot be skewed by interference. The distinction between how things are in normal conditions and what is due to hindrance does not apply. What is eternal simply exists without interruption. So the existential independence criterion applies straightforwardly in unrefined form (1050^{b}19; see §11 below for further discussion).

7. 1050^{a}10–14: Capacity Possession and Capacity Exercise

Aristotle now moves to the relation between the possession and the exercise of a capacity: for example, between being a trained builder and building (he will consider the distinct relation between a capacity itself—as opposed to something's possessing a capacity—and its exercise later at 1050^{a}23–1050^{b}2). This sort of case featured in the five pairs of examples at *Θ*6, 1048^{a}37–1048^{b}4 (the relations of inactive to active builders, and sighted to seeing animals, appear in both *Θ*6 and *Θ*8). Aristotle again takes a teleological perspective: an animal possesses sight *in order that* it see, rather than vice versa. It is because he takes that teleological perspective that the case of acquiring capacities through practice, raised at 1050^{a}13–14, is such a troublesome counter-example, for prima facie it looks as if the novice precisely does exercise the capacity *in order to* possess it. Aristotle's remark on the case of practice is compressed and hard to follow, not least because the text at 1050^{a}14 is difficult: see Ross (1924: ii. 262–3) for the options and further comment.

According to [RE] the exercise of a capacity will be prior in substance to its possession so long as in normal conditions the capacity is exercised and not merely possessed. A main result of *Θ*5 was:

[A] As regards one-way capacities: necessarily (if agent and patient are in the right condition and related in the right way, then action results).

[A] says that in normal conditions an agent possessing a capacity to ϕ exercises that capacity and ϕ's. If an agent possesses but does not

exercise a capacity, then something is preventing its exercise. For example, if a fire is hot but is not currently heating, then something is preventing it heating: perhaps a cold wind is blowing or there are no heatable objects in the vicinity. It follows that the exercise of a capacity is prior in substance to its possession. A similar point holds for two-way rational capacities, though reference is required to the role of an agent's choice in directing the capacity to one or another of its opposed outcomes (see Commentary, Chapter 5, §10, for further discussion).

8. 1050^{a}15–23: Matter and Substance

Now another instance of the potential–actual schema: the relation of pre-existing matter to the substance it composes. The crucial argument is in the first sentence (1050^{a}15–16). It is the reference at 1015^{a}15 to matter acquiring the relevant form which suggests that the focus is on pre-existing matter, which can be first potentially F and then actually F. The argument is built on the account at *Θ*7, 1049^{a}5–18, of the conditions under which something is potentially F. Something is potentially F so long as it is suitable for being turned into something actually F by the exercise of an appropriate single capacity (see Commentary, Chapter 7, §§4–6). What the appropriate capacity is will be different in different cases: something is accounted potentially healthy by reference to medical skill, potentially hot by reference to heat.

Aristotle can now plug in the results from *Θ*5: that of necessity a non-rational one-way capacity is exercised in normal conditions (in the case of a rational capacity we add: so long as the agent chooses to exercise it). It follows that something which is potentially F will, when acted on appropriately in normal conditions, result in something actually F. For example, if these materials are potentially a house, then an exercise of building skill upon them, directed by a choice to build, in normal conditions will result in something which is actually (and not potentially) a house; whereas something which is still potentially (and not actually) a house—for example, half-built walls, or piles of bricks and wood—results from interference with the builder's exercise of her skill. So, according to [RE] the actually F items which are produced in normal conditions (for example, houses) are prior in substance to the potentially F items from which they are produced (for example, bricks and timbers).

That line of argument lies behind 1050^{a}15–16 viewed in the context of Chapters 5 and 7. The material which follows 1050^{a}15–16 is opaque, and falls into three parts:

(i) 1050^{a}16–17: a generalization;
(ii) 1050^{a}17–21: an analogy which is intended to illustrate and support that generalization;
(iii) 1050^{a}21–3: a comment on etymology.

(i) The 'other cases' are those concerning the capacity–change relation (1050^{a}10–14, 1050^{a}32–1050^{b}2); the second 'and' is explicative and should be read *namely*. The similarity is that in each case an item on one side of the actual–potential schema (a substance, a change) stands in a teleological relation to a correlative item on the other side (some matter, a capacity).

(ii) The teacher analogy at 1050^{a}17–21 is intended to show that the teleological perspective is equally appropriate for other-directed capacities and self-directed natures (signalled at 1049^{b}4–10 and 1051^{a}2–3). Aristotle makes a point about taught capacities, and claims that it will carry over to natural capacities. The general idea is clear, but will be difficult to work through in detail.

There is good reason to suppose that a change (healing) stands in a teleological relation to the correlative taught capacity (medical skill). Teachers have a goal—namely, to impart a capacity; and they take themselves to have achieved that goal when their students *act* in the appropriate way: for example, the medical lecturer takes himself to have succeeded in training Candy when she sets about healing. Since the changes which are instances of healing are the clearest manifestation of the capacity which is the teacher's goal, we should take those changes themselves as goals relative to the capacity.

There would be difficulties working this through in detail, although Aristotle can finesse them here. The remark at 1050^{a}19–21 ('if it does not come about in this way . . .') suggests that he has in mind a point about evidence. A teacher's aim is to impart a capacity (for example, some medical knowledge). It is only when one sees the pupil being active that one can *tell* whether the knowledge has been transferred: whether the knowledge has been internalized by the pupil, or whether the pupil is merely being guided by knowledge which remains external to her, because it is possessed by, and internal to, the teacher alone (see Ross 1924: ii. 263–4 on Aristotle's

reference to Pauson's Hermes: Ross suggests that the allusion is to a type of painting in which the figures represented seem to stand out in relief from the surface). But learning a capacity often involves practice (*Θ*5, 1047^{b}33–4; *EN* 2.4, 1105^{a}22–6). So it will not be a straightforward matter to tell whether a pupil has been successfully trained on the basis of observing what she does: observation of A ϕ-ing will not establish conclusively that A has the capacity to ϕ, since A's ϕ-ing could be part of her acquiring the capacity. And it will be a complicated matter to say clearly how observation provides evidence for the attribution of taught capacities. That fact will generate pervasive difficulties for any general discussion of the teleological relation between a capacity and its exercise (it has already caused Aristotle problems at 1050^{a}13–14).

The comment (1050^{a}19) that nature does likewise is allusive. What parallel does Aristotle have in mind? Natural capacities like the senses are innate (*Θ*5, 1047^{b}31–2), and are not acquired at all. So Aristotle's point cannot be that the acquisition of natural capacities is complete when they are exercised. Perhaps his thought is that the fact that animals possess vision in order to see, rather than vice versa (1050^{a}10–11), shows nature treats an actuality (seeing) as an end, just as the fact that teachers go on until their pupils, act shows that they too treat actualities (for example, building) as ends.

(iii) Aristotle holds that we can think of an actuality teleologically, whether the actuality be a substance or a change (1050^{a}15–17). At 1050^{a}21–3 he supports this point by reference to the etymology of the word 'actuality' (see Introduction, §4, for background).

This appeal to etymology is striking, because both the words he mentions are neologisms ('actuality' *energeia*; 'fulfilment' *entelecheia*). In the more usual case etymology supports a point by providing independent linguistic data. For example, *Phys.* 2.1, 193^{b}12–18: Aristotle appeals to an alleged etymology of the Greek word *phusis* (from the verb *phuô* 'to grow') to support the claim that the nature of something is its form (compare *Met.* *Δ*4, 1014^{b}16–17). Or *EN* 2.1, 1103^{a}16–18: he refers to the etymology of 'of character' (*êthikê*) to support the claim that virtues of character are acquired through habituation (*ethos* 'habit'). These (alleged) etymologies function like other linguistic phenomena Aristotle mentions, such as the present–perfect test at *Θ*6, 1048^{b}18–35, and the *en*-idiom at *Θ*7, 1049^{a}18–24: the Greek language provides evidence or markers

of some underlying metaphysics (though it is a further and difficult question why a natural language should be like this).

But the case is different with *actuality* and *fulfilment*. These terms are deliberately coined and do not occur in natural language. Aristotle wants to bolster a point about the actual–potential schema: that all the various instances of that schema exhibit a teleological structure. First he provides a general term to refer to one side of the schema: 'functioning' (*ergon*: 1050^{a}21–2, functioning as actuality; compare *EE* 2.1, 1219^{a}13–18, on the point that the term *ergon* can refer both to the exercise of a capacity (for example, seeing) and to something resulting from the exercise of a capacity (for example, a house)). The appeal to etymology then goes as follows. It might seem surprising that an earlier neologism *energeia* is extended and developed so as to take on the role of a later neologism *entelecheia*. But that should not be surprising, given that

(*a*) *energeia* ('actuality') is derived from the term *ergon* ('functioning')
(*b*) *entelecheia* ('fulfilment') is derived from the term *telos* ('end')

and

(*c*) the functioning (*ergon*) is an end (*telos*).

Since the teleological perspective (*c*) makes it unsurprising that terms with the etymologies (*a*) and (*b*) should be connected, the fact that the two terms *are* connected and have the etymologies they do lends support to the teleological perspective embodied in (*c*).

9. 1050^{a}23–1050^{b}6: Capacity and Exercise

The issue here is the relation of a capacity (sight, building skill) to its exercise. In contrast the earlier 1050^{a}10–14 concerned the relation between something's possessing a capacity (an animal's being sighted) and its exercising that capacity (the animal's seeing). Why treat these separately, since the same relation enters into each (capacity–exercise as opposed to matter–substance)? It is because the teleological perspective is more straightforward for the first than the second. Aristotle simply states that animals have sight in order to see, and builders possess skill in order to build (1050^{a}10–12). In contrast, he has to go through some intricate arguments in the present passage.

Aristotle faces a problem. The discussion so far has encouraged an emphasis on identifying ends with *results*. Adult human beings are the end result of a process of generation and development (1050^{a}5–10). The process of learning the building craft results in someone actually building (1050^{a}10–14, with the teacher analogy at 1050^{a}17–21). And a substance is the result of the imposition of form on pre-existing matter (1050^{a}15–23). This leads to two difficulties.

[A] Some capacities do not issue in results. Actual seeing is an exercise, not a result, of the capacity to see. In such cases there is just the capacity and its exercise (1050^{a}23–5, 34–5). Aristotle holds that in these cases the exercise (*actual* seeing) is prior in substance to the capacity (*potential* seeing). So he must show that in these cases too the exercise is teleologically related to the capacity. This is the conclusion stated at 1050^{a}27: 'it is nevertheless in the one case no less the end.'

[B] Some capacities do issue in results. When a builder exercises her skills and engages in some actual building, a house results (1050^{a}25–7, 30–4). Aristotle holds that the *exercise* is prior in substance to the capacity. So he must show that the exercise (active building) has a teleological relation to the capacity (building skill), in spite of the fact that the *result* (a house) may seem to be a more obvious goal. This is the conclusion stated at 1050^{a}27–8: 'in the other [case] more the end than the potentiality.'

[A] is the easier case to argue. Aristotle can again appeal to the claim established in *Met.* Θ5, that of necessity a non-rational one-way capacity is exercised in normal conditions (with an additional reference to the agent's choice in the case of a rational capacity). If someone sighted is not seeing, that will be because bad light or blindfolds are interfering and preventing her. The fact that it makes sense to talk of interference and prevention supports a teleological perspective. And, according to [RE], the fact that the capacity is exercised in normal conditions delivers the verdict that the exercise is prior in substance to the capacity.

[B] requires further argument, which is provided at 1050^{a}28–1050^{b}2. Aristotle does not deny that, if the exercise of a capacity issues in a result, then the result is indeed an end (compare *EN* 1.1, 1094^{a}3–5). Rather, he argues that nevertheless the exercise is *more*

of an end than the capacity. And that conclusion is derived from two further claims about the exercise:

(i) concerning its *location* (stated 1050^{a}28–9, developed in connection with the result–no-result distinction at 1050^{a}30–1050^{b}2);
(ii) concerning *simultaneity* (1050^{a}29).

Neither (i) nor (ii) is straightforward.

The claim made in (ii) concerns the *exercise* of a capacity (for example, the act of building) and the *result* of that exercise (the house): that they are simultaneous. But (i) does not say anything about the *result* at all. Aristotle does not say that the act of building is in *the house*. He says that the act of building is in *what-is-being-built*: that is, the materials—bricks, wood, etc.—which are being affected by the builder and being turned into a house (compare *Phys.* 3.3, 202^{a}13–14, 31). And it would in fact be very implausible to say that an act of building is located *in a house*, because a house exists only once the act of building is finished. What does Aristotle gain by saying that the exercise of a capacity is (ii) simultaneous with its *result*, and (i) located in the *materials*?

Anyway, what exactly is Aristotle's point in (ii) about the temporal relation between an exercise and its result? What seems to be claimed at 1050^{a}29 is that the act of building *comes to be* at the same time as the house, and that it *is* at the same time as the house. But again that would be very implausible. When the act of building is going on, the house does not yet exist; and the house carries on existing after the act of building is finished. Further, the house does come into being, but the act of building does not (*Phys.* 5.2, 225^{b}14–16: there is no coming to be or change of a change). So it would be better to read 1050^{a}29 as an excessively compressed statement of the far more plausible claim that an act of building *exists* at the very same time as a house *comes to be*.

What about Aristotle's claim in (i) that an act of building is located in the materials being built? That is the plausible view that it is primarily due to facts about what a builder works on (for example, that bricks and timber are being arranged in certain ways) rather than facts about a builder (for example, that she is moving her arms in certain ways) that an act of building is going on. If a builder were moving her arms appropriately, but no bricks and timber were being structured, then that could as well be pretence

or miming as the occurrence of an act of building; while, if bricks and timbers were being arranged while the builder was not moving her arms, but rather giving instructions to an apprentice, then that would still be the occurrence of an act of building. (Compare Commentary, Chapter 1, §6, on how to understand talk of the location of capacities.)

How do (ii) and (i) support Aristotle's conclusion at $1050^{a}27–8$, that, even when there is a result, still the exercise of a capacity is more of an end than the capacity? Claim (ii) is more obviously relevant, since it is at least about the exercise and the result. Since the result (for example, a house) is uncontentiously an end relative to the capacity (building skill), and since, according to (ii), the exercise (the act of building) stands in a closer temporal relation to the result than it does to the capacity, then the exercise inherits the result's claim to stand as an end relative to the capacity.

The argument about location in (i) is less straightforward, since (i) does not say that the exercise of a capacity is located in the result. Perhaps the thought behind (i) is this. When a capacity such as building skill is exercised, some materials (bricks and wood) are turned into a result (a house). According to *Θ*7, it follows that those materials are potentially that result: the bricks and wood are potentially a house. The result is uncontentiously an end. Since the exercise of the capacity (the act of house building) is located in the materials, and since the materials will turn into the result (a house), the exercise is more closely related to the end result than is the capacity. The exercise is more of an end than the capacity.

The remark at $1050^{a}36–1050^{b}2$ on flourishing (or happiness) is an aside. The thought is presumably that the capacities characteristic of life do not issue in results; so their exercise occurs in the living organism; but, since flourishing is exercising those capacities well, then flourishing is also located in the living organism, and not in any external products such as wealth or fame.

Aristotle follows a summary statement of his conclusions so far ($1050^{b}2–4$) with a comment about the temporal relations between actualities ($1050^{b}4–6$). The back reference at $1050^{b}4$ is most plausibly to the discussion of temporal priority earlier in the chapter at $1049^{b}17–29$. If that is correct, then 'that which is primarily bringing about change' would not refer to the Unmoved Mover of the cosmos (*Met.* *Λ*6–7): the term 'in time' at $1050^{b}4$ also tells against such a reference, since what is significant about the Unmoved

Mover is not its temporal relation to the changes it sustains. It is preferable to take it that Aristotle has in mind here temporally extended causal chains in which an agent uses a series of actual intermediaries in order to produce a change (for example, a doctor using medicine to affect the body to produce healing: compare *GC* 1.7, $324^{a}24–324^{b}4$). His point will then be that each such temporal chain must start with something actual. But this passage is opaque, and tangential to Aristotle's main line of argument. (See also the comment on $1049^{b}26–27$ at §4 above.)

10. A Summary: Perishable Substances

At *Θ*8, $1050^{b}6$, Aristotle turns to a new instance of the potential–actual schema: the relation of perishable to eternal things. Now is an appropriate point to take a step back, draw together some threads from the discussion so far, and see how *Met. Θ* is relevant to problems about perishable substances inherited from *Met. Z* and *H*.

Earlier (Introduction, §6) I described this problem. How can there be generated and perishable substances? If they are to be generated and perishable, they require material precursors and remnants. But those material components threaten the unitary nature required of a genuine substance. This problem goes to the heart of Aristotle's theory of perishable substance: the relation of form and matter. It is not clear how it should be resolved, and it is not clear how Aristotle tries to resolve it. But the more limited task here is to see how the discussion up to this point in *Met. Θ* fits into the broader dialectic set by that problem.

One sort of approach to the problem would have the following tripartite structure. Aristotle's view is that it is living organisms which have a strong claim to be perishable substances: human beings and trees, rather than bronze statues. If we apply to these favoured candidates the distinction between immediate (higher-level) and mediate (lower-level) matter, then we obtain a solution which has three components.

First there is an account of the *immediate* matter of living organisms which satisfies the requirement that substances have a unitary nature. Flesh and bone compose an animal, but neither pre-exists nor survives it. Candy is not made out of flesh and bone which was already there before she was. On the contrary, the flesh and bone of which she is composed comes into existence as she comes

into existence. And, when Candy dies, the flesh and bone of which she was composed cease to exist: they cease to be flesh and bone, because they can no longer do any of the things characteristic of flesh and bone. Since the immediate matter is concurrent, the threat posed to the organism's unity recedes. It no longer seems that there are independent identity conditions associated with the immediate matter and with the form.

There is conflicting evidence as to whether Aristotle does hold that the immediate matter of living organisms is concurrent. At *GA* 2.1, 734^{b}24–36, he says explicitly that there can be no such thing as dead flesh; *Meter.* 4.12, 389^{b}29–390^{a}15, is more cautious; *PA* 1.1, 640^{b}35–641^{a}5, makes the point about structured parts like eyes or hands, but not about material parts like flesh and bone. On the other hand, though, at *Met. Z*10, 1035^{a}18–19, 33, he says that a human being decays into flesh and bone.

Second, the requirement for material precursors and remnants is satisfied by an organism's *mediate* matter, which does pre-exist and which does survive. A human being is generated naturally out of some appropriate matter, as opposed to appearing miraculously out of nowhere: according to Aristotle, unconcocted blood provided by the female parent. And a human being perishes naturally into remnants, as opposed to vanishing and being miraculously replaced by a corpse: rotting flesh, and eventually some elemental stuffs.

The *third* component of this type of approach is an account of the relation between an organism's immediate and mediate matter: between the flesh and bone which is concurrent with the animal, and lower-level stuffs from which they are generated and into which they perish. However this account goes in detail, one can see what shape it would have to take. The mediate matter, which pre-exists and which survives, had better not compose the immediate matter in such a way as to pose its own threat to the organism's unity. If it did, nothing would be gained from the detour via the immediate–mediate distinction. The mediate matter should be present in the immediate matter in some attenuated or qualified way, its own elemental nature subsumed somehow in the nature of the flesh and bone of which the animal is immediately composed.

Each component of this type of solution would need to be worked through in detail. The third component is particularly difficult. Aristotle's treatment of the relation between the immediate and

mediate matter of living organisms will connect in some way with his account of mixture at *GC* 1.10. Mixture is what occurs when, for example, water, sand, and cement form concrete. It is distinct from the mere juxtaposition of particles involved in shaking salt and pepper together. Mixture results in a homogeneous product with its own new properties. However far we divide down the product, Aristotle thinks that we just get smaller and smaller bits of the very same product. In contrast, if we were to divide salt and pepper down far enough, we would eventually get to small discrete bits of salt and bits of pepper. What happens to the ingredients from which a homogeneous product is combined? On the one hand, they are not simply destroyed. We turn cement, sand, and water into concrete, which is made out of those ingredients. It is not that cement, sand, and water are destroyed, and then concrete created. And the properties of the resulting concrete seem to owe something to the ingredients from which it is made: add too much water to start with, and the resulting concrete will be too runny. But, on the other hand, the ingredients do not simply survive. If they did, then there would be no difference between mixture and mere juxtaposition. The salt and pepper do simply survive unchanged when shaken together: that is precisely why dividing far enough gets us back to discrete granules of salt and pepper. Aristotle's view is that the ingredients are not present actually when combined, but they are present potentially (*GC* 1.10, $327^{b}22–31$). And in some cases, if the product decays, the ingredients may come to be present actually again: if you do not stir the concrete, it may separate out into cement, sand, and water again. But precisely how the *GC* 1.10 account of mixture applies to the relation between the mediate and immediate matter of a living organism will be a matter for debate (for more on Aristotle's account of mixture, see Wardy 1990: ch. 6; Fine 1995).

I will focus only on the first component: the view that, since the immediate matter is concurrent, it is not sufficiently independent of the organism to pose a threat to its having a unitary nature. As it stands that view does not fix the precise relation between an organism and its immediate matter. It is consistent with an organism's being *identical* with its immediate matter. And it is consistent with the organism's standing in some weaker relation to its immediate matter. Aristotle makes a carefully qualified claim at *Met. H*6: the immediate matter of an F and the form F stand to one another as what is potentially F to what is actually F (*H*6,

$1045^{b}17–19$). The discussion up to *Met.* Θ8, $1050^{b}6$, fills that claim out: the organism which is actually human is prior in substance to its immediate matter, which is potentially human.

What does that mean? Aristotle explained in *Met.* Θ7 that matter which pre-exists an F is potentially F in virtue of some capacity whose exercise is sufficient to turn it into something actually F. The capacity is different in different cases: medical skill in the case of what is potentially healthy, heat in the case of what is potentially hot. Θ8 shows that the exercise of a capacity is prior in substance to the capacity, since the capacity is exercised in the absence of interference or hindrance. And therefore something which is actually F is prior in substance to the matter which pre-exists it and is potentially F.

That account can be extended to matter which composes (as opposed to pre-existing) an F. The matter composing an F is potentially F in virtue of some capacities, the exercise of which *is* the matter's actually composing an F. Flesh and bone are potentially human because they have the capacities to transport nutriment, support tissue, flex, and move in characteristic ways: and it is in actually transporting nutriment, supporting tissue, and flexing and moving that they are actually composing a human being. Those capacities, like any others, are of necessity exercised in normal conditions. So the exercise of those capacities is prior in substance to the capacities themselves. So something which is actually F is prior in substance to the matter which is composing it and is potentially F. If the immediate matter of a living organism is concurrent, then it only ever composes—and never either precedes or survives—the organism. But Aristotle has shown that it is reasonable to think of the immediate concurrent matter of an organism F as potentially F. The point is emphasized in the discussion of levels of composition at Θ7, $1049^{a}18–24$. The *en*-locution marks the case where A is potentially F. The *en*-locution is not transitive: the box is wooden, and the wood is earthen, but the box is not earthen. So, while the immediate matter is potentially human, the lower level mediate matter is not potentially human (Θ7, $1049^{a}1–3$). Consequently an organism can stand in the close relation to its immediate matter as the first component of the tripartite solution requires, while standing in a more distant relation to the mediate matter, as the second component claims.

11. 1050b6–22: Eternal and Perishable Things

A third instantiation of the actual–potential schema is introduced: the eternal–perishable relation. Aristotle wants to confirm that, in the case of this new instantiation too, actuality is prior in substance to potentiality. Just three types of priority were mentioned at the start of *Θ*8: priority in account, time, and substance (1049b10–12). So it is unlikely that a fourth notion of priority is here brought into play unannounced. That is borne out by 1050b7, which mentions priority in substance. It is unclear why this is a 'more proper way' (1050b6) in which actuality is prior in substance. The point may be that the existential independence criterion applies more straightforwardly and perspicuously in case of the relation between eternal and perishable things (compare §6 above).

Two claims are made at 1050b6–8:

[1] eternal things are prior in substance to perishable things;
[2] nothing eternal is potentially.

Claim [2] locates eternals on the actuality side of the dichotomy, perishables on the potentiality side. It follows, given [1], that actuality is prior in substance to potentiality in the case of the eternal–perishable relation. Aristotle offers no explicit argument in support of [1]. His attention is focused on [2]. The argument announced at 1050b8 is entirely in support of [2]. The lines 1050b16–17 state [2], incorporating the *without qualification/in a certain respect* distinction drawn at 1050b14–16. The conclusion at 1050b18, that everything eternal is actually, is intended as equivalent to [2].

Why should it seem that [1] requires no supporting argument? Claim [1] will be true so long as both

[1A] it is possible for there to be eternal things without perishable things

and

[1B] it is not possible for there to be perishable things without eternal things

are true. There are two ways of taking those claims, according as the possibility is given wide or narrow scope. If given wide scope, [1A] and [1B] come to

Wide [1A] it is possible that there should be a world containing eternal things but no perishable things

while

Wide [1B] it is not possible that there should be a world which does not contain eternal things, but does contain perishable things.

Aristotle may be in no position to endorse wide [1A]. And, while he would endorse wide [1B], it is not an uncontentious claim, and his endorsement requires the extended line of argument pursued though *Phys.* 8 (8.1: change is eternal; therefore, given some substantive claims about change, 8.4–5, it follows that there must be some eternal producer of change, 8.6; compare *Met.* Λ6).

On the other hand, if possibility is given narrow scope [1A] and [1B] come to

Narrow [1A] as regards the eternal and perishable things that there are (it is possible that the eternal ones should exist and the perishable ones not exist)

while

Narrow [1B] as regards the eternal and perishable things that there are (it is not possible that the eternal ones should fail to exist, while the perishable ones do exist).

These do seem uncontentious, granted only the further assumption that something's being eternal has modal force: what exists eternally is imperishable, and more generally what is eternally the case is necessarily the case. Aristotle does hold that view (*Top.* 2.6, $112^{b}1$–2; *Cael.* 1.12, $281^{b}25$; *GC* 2.9, $335^{a}33$–4; 2.11, $337^{b}33$–$338^{a}3$, *Met.* *E*2, $1026^{b}27$–30; *N*2 $1088^{a}23$–5). And, as we shall see, the same assumption plays a role in Aristotle's argument for [2] at $1050^{b}8$–18. Given that assumption, narrow [1B] is plainly true, just because things which are eternal are imperishable, and, as regards things which are imperishable, it is not possible that they should not exist. And narrow [1A] also has an immediate appeal because, as regards things which are perishable, it is possible that they should in fact perish. So it is unsurprising that Aristotle does not offer explicit argument for [1].

Claim [2] by contrast is much more difficult. Claim [2] says that something which is eternally F should not be thought of as eternally

manifesting a potentiality to be F. On the contrary, something which is eternally F is actually F without being potentially F (compare the compressed summary at *Int.* 13, $23^{a}22–6$). The distinction at $1050^{b}14–16$ between perishability in different respects shows that the point applies both to what exists eternally, and what is eternally F for a predicate in a non-substance category: for example, something which is eternally changed ($1050^{b}20–1$).

This is a significant departure from the way in which the potentiality–actuality schema has been understood so far. In *Θ*1–5 the focus was on change as originating from a capacity which of necessity is exercised in the right conditions (*Θ*1, 2, 5: potentiality is characterized as an origin of change at the beginning and end of *Θ*8, $1049^{b}5–10$, $1051^{a}3$). The hope in *Θ*6–7 was to see a substance as an actuality relative to the matter of which it is composed. The model introduced by [2] is very different. An eternal change is *not* the exercise of an underlying capacity (potentiality). A substance which is eternally (F) is *not* an actuality relative to any potentiality (to be F).

A further complexity is that Aristotle's own attitude to this new model is not settled. At *Phys.* 8.10 Aristotle speaks of the unmoved mover as possessing an infinite potentiality ($267^{b}17–26$, in the course of an argument to show that the unmoved mover has no magnitude, and repeated at *Met.* *Λ*7, $1073^{a}5–11$). At *Cael.* 1.12 he refers to the potentiality to exist for an infinite time (for example, *Cael.* 1.12, $281^{b}29–32$, $283^{a}7–10$).

Lines $1050^{b}8–18$ comprise Aristotle's core argument for [2]. It is interrupted at $1050^{b}14–16$ by the distinction between different respects in which something can be imperishable, and that distinction qualifies the conclusion at $1050^{b}16–18$. The main argument is followed by three corollaries of [2]. Lines $1050^{b}18–19$: something which is necessarily (F) is not relative to a potentiality to be (F). Line $1050^{b}20$: a change which goes on eternally is not the exercise of a potentiality (that is, capacity) for change. Lines $1050^{b}20–2$: something which eternally undergoes a change is not exercising a potentiality (that is, capacity) to change.

The comments which follow concentrate on the core argument. Claim [2] says that nothing can be both eternally (F) and potentially (F). That follows from two further claims:

[2A] If something is eternally (F), then it is imperishable (in respect of F) ($1050^{b}16$).

[2B] If something is potentially (F), then it is perishable (in respect of F) (1050^{b}14).

Claim [2A] receives little attention. Its place in the argument shows up in the fact that [2] is first stated as a claim about what is *eternal* (1050^{b}7–8), and then at 1050^{b}16 *eternal* is replaced by *imperishable*. This replacement is licensed by the assumption we have already met underlying the intuitive appeal of [1]: that what is eternally (F) is necessary and imperishable (in respect of F).

The bulk of 1050^{b}8–16 comprises an argument for [2B]. The argument turns on a principle stated at 1050^{b}10–11 (compare *Int.* 12, 21^{b}12–17; *Met. B*6, 1003^{a}2; *Λ*6, 1071^{b}13–14, 19, 25–6; *N*2, 1088^{b}19–20):

[FAIL] Anything potential can fail to be actual.

In order to appreciate Aristotle's argument, it is important to assess [FAIL]'s appeal correctly. The plausibility of [FAIL] depends on whether it is taken as a claim about a standard or a non-standard modality. [FAIL] would be implausible as regards those standard modalities for which necessity implies actuality and actuality implies possibility (see *Int.* 13, 22^{b}29–23^{a}26, and *An. Pr.* 1.13, 32^{a}15–29: Aristotle is sensitive to the tension between two intuitions—that possibility is two-way contingency, which [FAIL] expresses; and that necessity implies actuality implies possibility). Claim [2]'s endorsement of detached actuality will be a non-starter if what is at issue is possibility as a standard modality (compare Introduction, §7).

On the other hand, [FAIL] is more plausible if understood as a claim about the capacities for change which were the subject of *Θ*1–5, and the potentialities of *Θ*6–7. So, in assessing Aristotle's argument for [2B], I will take [FAIL] as a claim about the richer non-standard notion of potentiality. This decision shows up in my translation. In line with my translation policy (Introduction, §3), the verb *endechesthai* has been rendered 'can' at 1050^{b}10, 11, 13, 15. The noun *dunamis* has been translated as 'potentiality' or 'potentially' (depending on case) at 1050^{b}8, 17 (and through to the end of *Θ*8: 1050^{b}21, 25, 27, 30–1, 1051^{a}2). The cognate adjective *dunaton* is translated as 'capable', since [FAIL] is plausible only if it concerns a non-standard weak modality.

The opening remark (1050^{b}8–9), that *every* potentiality (for being F) is at the same time for the contradictory, is consistent with

the view of *Θ*2, 1046^{b}4–5, that it is only rational capacities which are two-way capacities for opposites (compare also *Θ*9, 1051^{a}5–13, and see Commentary, Chapter 2, §5). Aristotle's argument for [2B] requires only a weak claim, which is licensed by [FAIL], and which holds of both non-rational and rational capacities: there can be times at which a capacity is possessed but not exercised (this is what Aristotle seeks to establish through the anti-Megarian arguments of *Θ*3, 1046^{b}29–1047^{a}29). In contrast, *Θ*2 makes a much stronger claim, which holds only in the case of rational capacities, and which would not be licensed by [FAIL]: that the exercise of a rational capacity to ϕ may in normal conditions be either (*inter alia*) an instance of ϕ-ing or (*inter alia*) an instance of contra-ϕ-ing (see Commentary, Chapter 2, §4, for the terminology).

The argument for [2B] runs like this. Suppose A is potentially (F). That potentiality can fail to be actual (1050^{b}10–11). So A can be (F) and A can fail to be (F) (1050^{b}11–12). Since A can fail to be (F), A is perishable (in respect of F) (1050^{b}13–16). So [2B] if A is potentially (F), then A is perishable (in respect of F).

Claims [2A] and [2B] together give [2], the moral of which is that there is a fundamental metaphysical difference between what is temporarily or intermittently (F) and what is eternally (F). The former does, while the latter does not, involve the actualization of an underlying potentiality to be (F). An anti-Aristotelian who denies [2] will see no fundamental metaphysical difference between what is temporary and what is eternal. According to this anti-Aristotelian, if something is F for a limited period of time or intermittently, then that is the limited or intermittent actualization (exercise) of a persisting potentiality (capacity) to be (F); and, in just the same way, if something is eternally (F), then that is the eternal actualization (exercise) of a persisting potentiality (capacity) to be F. Now, since [2] is derived from [2A] and [2B], there will be two distinct ways of challenging [2]. One is to reject

[2A] if something is eternally (F) then it is imperishable (in respect of F),

while another is to reject

[2B] if something is potentially (F) then it is perishable (in respect of F).

Consider an opponent who rejects [2A] but grants [2B]. In accepting Aristotle's argument for [2B] she also grants

[FAIL] any potentiality can fail to be actual.

But she attempts to draw the sting of [2B] by denying that temporal notions—in particular, being eternally (F)—have modal content. This opponent will say that something which is eternally (F) is eternally actualizing a potentiality to be (F). She allows that the potentiality to be (F) *can* fail, and she admits that what is eternally (F) is perish*able* (in respect of F). But she insists that something can be eternally perish*able* (in respect of F) and just never in fact *perish* (in respect of F). Since she allows that something which is eternally (F) is nevertheless perish*able* (in respect of F), she rejects [2A] and denies any modal content to temporal notions, even in the case of eternal things.

According to this first opponent, it is just a brute fact that some potentialities are actualized eternally, and others for varying but limited periods of time. There is no significant metaphysical difference between these types of case. Something which is eternally F is simply F for longer than something which is temporarily F. The intuition is that, *while* something temporarily F is actually F, then it is metaphysically on all fours with what is eternally F. At certain points in its career, something temporarily F is doing just the same thing as something eternally F: namely, *being F*. And the difference between something which is F eternally and something which is F temporarily and intermittently is just an extreme version of the difference between something which is F for 10 minutes and something which is F for 5 minutes.

Notice that someone who rejects [2A] in this way will also be unimpressed by Aristotle's assertion ($1050^b6–7$) of

[1] eternal things are prior in substance to perishable things.

Her rejection of [1] is in line with the tenor of her position, which is to downgrade the metaphysical significance of something's being eternally (F). And she rejects the view which—as noted above—underlies Aristotle's endorsement of [1]: that what is eternal is imperishable and therefore can exist independently of what is perishable.

A second type of type of opponent will grant [2A], but deny

[2B] if something is potentially (F) then it is perishable (in respect of F).

Aristotle has an argument for [2B], but this opponent evades that argument by rejecting the principle on which it turns:

[FAIL] Any potentiality can fail to be actual.

According to her view, something which is eternally F is eternally actualizing a potentiality which *cannot* fail to be actualized. She is willing to grant [2A] and admit a modal content to temporal notions. So, if something is *eternally* actualizing a potentiality to be (F), then it is not even *possible* that the potentiality not be actualized.

The trouble with this opponent is that her view concerning potentialities and capacities looks unmotivated. It is unclear what she gains by insisting on potentialities (capacities) which can *never* fail to be actualized. She goes beyond the position Aristotle argues for in *Θ*5: that capacities cannot fail to be exercised *in the right conditions*. If paper is dry and is in contact with an electric ring and the electric ring is switched on, then it is not possible that the paper's passive capacity to be burned should fail to be exercised. But often conditions are not right, and paper is not being burned. And so there is some conceptual gain in attributing to various things a persisting capacity to be burned: the capacity serves to explain, for example, why the same stuff that burned yesterday also burns today (recall Introduction, §7). However, the position is quite different if we attribute to A a capacity (potentiality) which is necessarily and eternally exercised (actualized). In that case the capacity serves no explanatory purpose. In particular, it does not explain why A is eternally (F). In order to explain that one would need to say *why* the capacity (potentiality) is eternally and necessarily exercised (actualized). If that is just a brute fact, then one may as well stick with the brute fact that A is eternally (F), and exclude the capacity (potentiality) from the picture altogether. And, if there is something else which is eternally and necessarily the case and which explains why the capacity (potentiality) is eternally and necessarily exercised (actualized), then again the capacity (potentiality) appears to be doing no explanatory work. In rejecting [FAIL] these anti-Aristotelians cut the ground from under their own feet. Potentialities (capacities) are useful precisely because they can persist even when unactualized (unexercised). Potentialities which *cannot* fail to be

actual are redundant, and to insist on them is really just to insist on a form of words. (Compare here the argument at Introduction, §7, intended to motivate sympathy for a commitment to detached actualities.)

A final point about this second opponent. The logical structure of her position would be more appropriate if what was at issue was a view about standard possibility, rather than a view about the richer non-standard notion of potentiality. In granting [2A], she would be assimilating what is eternally (F) to what is necessarily (F). If the necessity in question were related to the standard notion of possibility, then her rejection of [FAIL] would be an entirely sensible recognition that, when necessarily p entails possibly p, then the possibility at issue cannot be two-way contingency. The correlate of [2B] would in that case also be false: if A's being necessarily (F) entails A's being possibly (F), then it cannot further follow that A is perishable (in respect of F). But a view about standard possibility would fail to make contact with Aristotle's concerns. The moral Aristotle wishes to draw in the course of $1050^{b}6–22$ is that something's being temporarily or intermittently (F) involves an explanatory capacity (potentiality) to be (F), while something's being eternally (F) does not. Standard possibility, however, is never explanatory.

12. $1050^{b}22–8$: A Cosmological Consequence

Aristotle's main argument concerning eternals and perishables is followed by three blocks of material. First he draws attention to a cosmological consequence of the preceding material ($1050^{b}22–8$, this section). Second, there is a further comment on the relation between the eternal and the perishable ($1050^{b}28–34$, §13 below). Finally, there is a brief remark concerning Platonism ($1050^{b}34–1051^{a}2$, §14 below).

What is the line of thought in the present passage? Aristotle makes two points about an eternal change, such as the sun's motion in the heavens. Each is supposed to follow from the main result of the preceding discussion, that something which is eternally (F) is not eternally actualizing a potentiality to be (F).

First, there is no fear that the motion might stop ($1050^{b}22–4$). This is the easier of the two points. The upshot of the preceding discussion is that the sun's eternal motion is not correlated with

an underlying potentiality to move. Lines 1050^{b}20–2 make it clear that the potentiality at issue is a potentiality *to move*. The sun does, while at one place, have an unactualized potentiality *to be at another place*. That aligns perfectly with Aristotle's main conclusion. The sun is eternally moving, and has no potentiality to move (1050^{b}7–8); but the sun is not eternally at any particular place, and so does have a potentiality to be at this place or that place (1050^{b}21–2). Since the sun does not have a potentiality to move, which may be either actualized or quiescent (1050^{b}10–11: FAIL), there is a shift in the burden of explanation concerning the sun's motion. It is not necessary to explain why the potentiality should continue to be actualized rather than lapse into quiescence, because there is no such potentiality.

Second, the sun does not get tired, and its eternal motion is not laborious (1050^{b}24–8). The task here is to see through the anthropomorphism. There is a model which makes good sense of Aristotle's way of talking. Suppose A is exhibiting some activity ϕ, but that, left to itself, A would not be ϕ-ing: for example, the water is increasing in temperature, but left to itself it would not be doing so. Then we might say that A's ϕ-ing requires some effort or input from outside: something other than A is getting A to ϕ. In that case it is the asymmetry between what A would do left to itself (the default for A), and what A can be made to do, which fills out what is meant by saying that some of A's activities are laborious and involve effort, and some are not.

Compare the present passage with *Cael.* 2.1, 284^{a}14–18: the eternal movement of the heavens is effortless and not uncomfortable (see also 284^{a}27–35). In the *De Caelo* passage Aristotle fills out that remark with an asymmetry which makes good sense of the anthropomorphic language: he refers to the distinction between what is natural and what is non-natural. The eternal motion of the sun is natural, and not due to constraint: there is not something else which the sun would be doing if it were left to itself. And it is reasonable to express that point by saying that the sun's motion is effortless and involves no discomfort. However, the situation at *Θ*8, 1050^{b}24–8, is much less straightforward. The justification provided at *Θ*8 is that the sun's motion is a detached actuality: it does not involve a potentiality which may be either actualized or quiescent (1050^{b}24–6, 27–8). And it is not so clear how that justification helps to cash out the anthropomorphic language. Any reference at

this point in *Θ*8 to the distinction between what is natural and what is non-natural would be highly confusing. For Aristotle has already characterized nature as a type of potentiality (*Θ*8, 1049^{b}8–10), and at 1050^{b}22–8 we are considering motions which are detached from potentialities. But, in the absence of the natural/non-natural distinction, the inference from the sun's motion being detached from a potentiality to its being an effortless motion remains opaque.

13. 1050^{b}28–34: Imitation

Things which are changeable imitate things which are imperishable (1050^{b}28–9). The passage raises two broad issues. First, why does Aristotle make the claim here, and what is its contribution to his overall discussion of priority in substance? And, second, precisely what does the claim come to?

First, on the place of this passage in the argument as a whole. The discussion of priority in substance started at 1050^{a}4 has covered three instantiations of the actual–potential schema: change–capacity, substance–matter, and eternal–perishable. Aristotle has sought to show that in each case the item which is an actuality is prior in substance to the item which is a potentiality. He has also emphasized a fundamental difference between the first two and the third of these instantiations. A capacity is teleologically related to the changes it gives rise to, and matter is teleologically related to the substance it can turn into and compose. But there is no such relation between eternal things and perishable things. On the contrary, Aristotle's main point in 1050^{b}6–22 was that with eternal things we have actualities which are detached from any correlative potentialities. That fundamental difference between change–capacity and substance–matter, on the one hand, and eternal–perishable, on the other, does not, however, undercut the overall conclusion that actuality is prior in substance to potentiality (compare §11 above: in fact it makes it easier to see how the existential independence criterion applies to the eternal–perishable case).

Aristotle points out now that there is in fact a quasi-teleological relation between the eternal and the perishable. In certain respects perishable things *imitate* the continuous activity exhibited by eternal things (there will be more below on just what these respects are). The potentialities possessed by changeable things do not give rise to anything in the eternal realm: there are *no* potentialities correlative to

what is eternally the case. Still, the perishable and eternal realms are not brutely independent. The way in which certain potentialities are actualized in the realm of perishable things reproduces (mirrors, imitates) the eternal realm. And that secures a degree of unity between the two realms. Perishable and eternal things, however different, nevertheless constitute a single universe.

Second, what does Aristotle say on precisely *how* perishable things imitate imperishable things? There are a host of questions here. To start with, what is the range of *things which are in change* ($1050^b28–9$): does it cover only material elements, or are *earth* and *fire* simply examples to illustrate a wider general point? That question goes along with another. What is the constant activity that Aristotle has in mind (1050^b29)? If we start with the case of material elements, there are two options. The first is the natural motion of the elements: the upwards motion of fire, the downwards motion of earth. The second is the cyclical transformation of the elements into one another. The second alternative is supported by *GC* 2.10, $337^a1–7$, which says explicitly that the reciprocal transformation of the elements imitates eternal and continuous circular motion. If that is the correct way to take the reference to constant activity, Aristotle's point should also apply beyond the material elements, to other natural cyclical processes in the perishable realm: for example, the generation, reproduction, and decay of individual living organisms (*An.* 2.4, $415^a26–415^b7$: it is through reproduction that perishable organisms aspire to the eternal and divine). It is plain enough that Aristotle has natural processes in mind, though the conjunction *per se and in themselves* at 1050^b30 is puzzling. What is it for something to have a change in itself? Perhaps this is just a compressed way of saying that it has the *origin* of its change in itself—that is, that its change is natural (recall Introduction, §5, for some discussion of natural change).

Next, it is not clear how to take the contrast marked at 1050^b30 ('but the other potentialities . . .'). Aristotle might be balancing the similarity between eternal and perishable realms ($1050^b22–3$, 29: constant activity in each realm) against a respect in which they are different ($1050^b7–8$, 30–4: there are no potentialities in the eternal realm, while the perishable is replete with potentialities all of which are for opposites). Alternatively he might be drawing a contrast among the potentialities associated with perishable things. Some of these are always being actualized in a single way (namely, those

corresponding to the constant activity mentioned at 1050^{b}29: this may be a very limited set, if it comprises only the elements' natural capacities for motion). Others are for opposed results (and so are not constantly actualized). Now it is hard to see how this second reading of 1050^{b}30 aligns with the endorsement at 1050^{b}10–11 of [FAIL], the principle that *any* potentiality can fail to be actual. But that may not be such a serious obstacle, in light of the fact that 1050^{b}8–16 and 1050^{b}30–4 anyway diverge in their justifications for the claim that every potentiality is for the contradictory. (That divergence makes it unlikely that the back reference at 1050^{b}31 is to the earlier 1050^{b}8–16: a better candidate is *Θ*2).

How do the two justifications diverge? Lines 1050^{b}10–11 took no account of the distinction between rational and non-rational capacities. The point there was that any capacity could be possessed without being exercised. The line of thought at 1050^{b}30–4 is different. Rational and non-rational capacities are considered separately. The treatment of rational capacities (1050^{b}32–3) is straightforward and in line with *Θ*2. But the comment on non-rational capacities is strange (1050^{b}33–4: 'will be for the contradictory by being and not being present'.) The thought seems to be that a single non-rational capacity can be associated with opposed outcomes by being present in one sort of object, and not present in another. While this is not starkly inconsistent with 1050^{b}10–11, it does seem superfluous given the earlier remark. Further, it does not sound very convincing. Heat is present in fires, not present in sand; fires produce increases in temperature, sand does not; but it is hard to see how that gives a plausible content to the claim that heat is in some sense a capacity for opposites. Ross (1924) suggests understanding 1050^{b}33–4 in the light of Aristotle's comment at *Phys.* 8.1, 215^{a}31–215^{b}1, that a cold thing can in a way produce heat—namely, by turning away and retiring. Ross's reading (1924: ii. 266) of the *Physics* remark seems unattractive (he takes Aristotle's point to be that something cold can be heated up and then produce heat in something else). But there is a more appealing gloss on *Phys.* 8.1, 215^{a}31–215^{b}1, which will in its turn make better sense of *Θ*8, 1050^{b}33–4. The point suggested by the *Phys.* 8.1 passage is that reference to something cold can enter, in different ways, into explanations of both coolings and heatings. The typical way is when reference to something cold explains a cooling, by providing an origin of the change: the wine cooled down because it was placed in the cold ice bucket. The atypical way is

when reference to something cold is part of an explanation of how something hot is the origin of a heating in something else: the water heated up in the jar because you put it near the hot radiator and the water was cold from being in the fridge (had the water just boiled in the kettle, it would not have got any hotter when placed near the radiator). A non-rational capacity will be associated with one outcome by being *present* in an agent, and giving rise to a change in something else (heat in the fire gives rise to heat in the water). It will be associated with the opposite change by *ceasing to be present* in a patient under the influence of an appropriate agent (water cools down when it loses its capacity to heat, as a result of contact with ice).

14. $1050^{b}34$–$1051a2$: An Argument against Platonism

The argument is offered in passing. Comment will be brief. Aristotle's argument is this. A Platonic Form is supposed to be the primary item of its type: an exemplar which more properly and fully instantiates the kind of which it is the Form than does anything else falling under that kind. Consider, then, a kind such that, if something falls under that kind, it possesses a capacity (potentiality). For example, knowledge. If Candy acquires knowledge, then she acquires a capacity: namely, to express her knowledge in particular situations, for example, by answering questions in the right way. Candy's knowledge is a capacity (*Θ*6, $1048^{a}34$–5). So the Form Knowledge-itself should also be a capacity/potentiality: this is a point which Aristotle will force on Platonists, rather than one they make themselves ($1051^{a}2$). In that case, given Aristotle's argument that actuality is prior to potentiality, it will further follow that there is something prior to the Form. But that is inconsistent with the Platonist view of Forms as the primary exemplars of their kind.

CHAPTER 9

1. An Overview of the Chapter

The material in Chapter 9 is relevant to the issues discussed in *Θ*8. Yet this chapter is only loosely integrated with the preceding chapters. Further, *Θ*9 falls into two parts (1051^{a}4–21, 1051^{a}21–33), which are themselves only loosely integrated with one another: it would not matter much if the two halves of *Θ*9 had occurred in reverse order. Commentators have used the notion of a *folder* to characterize blocks of text where Aristotle gathers material which is relevant to, but not integrated with, the structured argument of the surrounding text (Burnyeat 2001: 70–4: examples are the material collected as *An.* 3.7 and *Met.* *H*3 and *H*4–5). Folders may contain reminders and corollaries which are best kept outside the main line of argument (like appendices in modern books); and material which is not yet, but could well be and might later have been, fitted into the surrounding argument (like imported material temporarily stored as footnotes in the course of electronic redrafting). Folders are not textual intruders, and thinking of some material as a folder does not cast doubt on its textual status. The material collected as *Θ*9 should be thought of as a folder.

The first part of *Θ*9 concerns the evaluative priority of actuality over potentiality (1051^{a}4–21); the second part is about epistemic priority (1051^{a}21–33).

The treatment of evaluative priority falls into two main sections. Aristotle argues first that a good actuality is better than the corresponding potentiality (1051^{a}4–15); then, second, that a bad actuality is worse than the corresponding potentiality (1051^{a}15–21).

The main conclusion established by the discussion of epistemic priority is that geometrical truths are made apparent and are known when the right potential constructions are rendered actual (1051^{a}21–4, 29–30). This is illustrated by two geometrical examples (1051^{a} 24–6, 26–9). Aristotle then explains and develops that conclusion (1051^{a}29–33).

2. Two Claims about Value

The passage 1051^{a}4–21 is about the relative value of actuality and potentiality. Just as in *Θ*7–8, Aristotle is talking at the level of the

actual–potential schema (recall Commentary, Chapter 6, §2). His general claim can be cashed out in terms of more specific instances of that schema. For example, an act of healing is better than medical skill; a house is better than the unstructured materials it was made out of; an adult human is better than a undeveloped infant. In general, when pairs of items instantiate the actual–potential schema, the (item which is a good instance of) actuality is better than the (item which is an instance of) potentiality. In some cases these evaluations may sound strange to the modern reader. In spite of that we can say quite a lot about Aristotle's arguments in the present passage (for a recent discussion, see Witt 2003: especially ch. 5).

Two claims about the relative value of actuality and potentiality should be distinguished. One expresses a *qualified* view:

[Q] [i] If an actuality is good, then it is better than the potentiality with which it is correlated; whereas [ii] if an actuality is bad, then it is worse than the potentiality with which it is correlated.

According to [Q], whether or not actuality is better than potentiality depends on whether the actuality in question is good or bad. Aristotle states and argues for [Q] in *Θ*9. Clause [i] is stated at 1051^{a}4–5, 15, and argued for at 1051^{a}10–15. Clause [ii] is stated at 1051^{a}15–16, and the argument for [ii] is summarized at 1051^{a}16–17.

The second is an *unqualified* claim:

[U] Actuality is better than potentiality.

Some commentators say that Aristotle argues for [U] in *Θ*9 (e.g. Witt 2003: ch. 4 §3). But there is no statement of—so presumably no argument for—[U] in 1051^{a}4–21. Further, [U] and [Q] are inconsistent. According to [U], any actuality is better than its correlative potentiality, while, according to [Q], some actualities are worse than their correlative potentialities. Should we conclude, on the basis of *Θ*9, that Aristotle does *not* endorse [U]? No: the position is just as with his claims about priority in substance. At *Θ*8, 1050^{a}4–1050^{b}6, Aristotle argues for an unqualified claim: actuality is prior in substance to potentiality (1049^{b}10–11, 1050^{a}4, 1050^{b}2–3). But at *Θ*9, 1051^{a}18–19, we find one half of a qualified claim: the bad is posterior in nature to potentiality—with the implication that the good actuality is prior in nature (*Met.* *Δ*11,

1019^{a}2–3, assimilates priority in substance and in nature). Maybe *Θ*9 makes qualified claims about priority and value which Aristotle elsewhere replaces with unqualified claims.

*Θ*9, 1051^{a}4–21, relies heavily on a principle about opposed outcomes (1051^{a}5–6, 10–11, 16–17):

[1] Every potentiality is correlated with two outcomes, which are opposed to one another.

If the opposed outcomes are equally deserving of the status of actuality, then we have the qualified claim [Q]. When using [1] as a premiss in *Θ*9, Aristotle says nothing explicit about the status of the opposed outcomes. So it is unsurprising that it is the qualified [Q] which predominates in *Θ*9.

But there are hints both inside *Θ*9 and elsewhere of a view which privileges one outcome of a potentiality over the other:

[2] It is the good outcome correlated with a potentiality which is most properly the actuality.

Given [2], the qualified claim [Q] can be replaced by the unqualified [U]. The argument goes: [1] every potentiality is correlated with a pair of opposed outcomes; [Q] the good outcome is better than, while the bad outcome is worse than, the potentiality; but [2] only the good outcome is properly an actuality; so [U] actuality is better than potentiality.

There is evidence of [2] at *Θ*9, 1051^{a}17–18. That text suggests that the status of the bad and the good outcomes of a potentiality is very different. Aristotle denies that *the bad* exists in addition to bad things. What is Aristotle's point? One option is that he is objecting to the Platonic view that there is a Form of Evil (Ross 1924: ii. 268; *Republic* III, 402c; V 476a; *Theaetetus* 176e). However, if that were his purpose, Aristotle could have made a parallel point about *the good*, since he also objects to the Platonic Form of Good (*EN* 1.6). But 1051^{a}17–18 is supported by a claim which applies only to *the bad* (1051^{a}18–19: the bad is posterior in nature to the potentiality). So it is unlikely that 1051^{a}17–18 has a Platonic target. The preferable alternative is that he is making a point about bad outcomes in particular, as opposed to good outcomes. That is why 1051^{a}17–18 is evidence of [2].

What point about bad outcomes in particular could Aristotle be making? Aristotle does think there is something which is *the good*, in

addition to the good outcomes of a potentiality: there is the form to which the potentiality is directed. For example, the hot fire transmits a form to the cold water which it heats up (*Phys.* 3.2, 202^{a}9–12; *GA* 2.1, 734^{a}30–3); and the doctor reproduces the form of health, grasp of which constitutes her medical skill, in the patient (*Met. Z*7, 1032^{a}32–1032^{b}23). The potentiality is aimed at realizing the form (*Θ*8, 1050^{a}4–7, 15–16); so the form is a goal, and a goal is a good (*Phys.* 2.8, 194^{a}32–3). It is this form (for example, health) which is the good which exists in addition to the good outcomes (for example, instances of healing or the individual healthy patients leaving the doctor's surgery). Aristotle connects form with actuality, and says that it is prior to potentiality (*Met. Θ*8, 1050^{a}5, 1050^{b}2–4; compare *H*3, 1043^{a}30–1; *H*6, 1045^{b}16–23). That gives one component of [2]: the good outcome associated with a potentiality is an actuality.

But the situation is different as regards the bad outcomes associated with a potentiality: for example, the defective houses which the expert builder erects on the cheap, or the injured patients who are the victims of the wicked doctor. In cases like that there is no single form instantiated in the variety of bad outcomes: there are just the bad outcomes, and no unifying form in addition. For example, there is no single form of illness at which the wicked doctor aims: instead, he takes expert steps to avoid the form health (*Met. Z*7, 1032^{b}2–6, and *EN* 2.6, 1106^{b}28–35, incorporating the claim that the bad is unlimited or indeterminate, the good limited or determinate; recall also Commentary, Chapter 2, §7, on the asymmetry between the opposed outcomes to which a rational capacity can give rise). So there is no actuality which is the form associated with the bad outcomes of a potentiality. That gives the second component of [2]: the bad outcome of a potentiality is not properly an actuality. (See §4 below for more on 1051^{a}17–18 and its relation to 1051^{a}18–19.)

Principle [2] also shows up outside *Θ*9. For example, it is evident in the idea of *Θ*2 that a rational capacity is not indifferently related to the opposed outcomes to which it can give rise (1046^{b}7–15: principle [C] at Commentary, Chapter 2, §7). And there is also the discussion at *Met.* H5, 1044^{b}29–1045^{a}6, of opposed material potentialities, and in particular the distinction between what is matter in virtue of a positive state and form—as water is matter for, and potentially, wine—and what is matter in virtue of a privation and a destruction contrary to nature—as water is matter for, and potentially, vinegar (1044^{b}31–4).

To summarize. There are two views about the relative value of actualities and potentialities. Principle [2], which privileges one set of outcomes over the other, allows Aristotle to replace the qualified claim [Q] with the unqualified [U]. Within *Θ*9, 1051^{a}4–17 supports [Q]. I comment on the argument below (§3). Principle [2] surfaces at 1051^{a}17–19: I discuss that passage at §4. Finally (§5) I will say something about Aristotle's remark (1051^{a}19–21) on the eternal–perishable relation.

3. 1051^{a}4–17: The Qualified Claim about Actuality

The arguments in *Θ*9 rely on the principle that every potentiality is for opposed outcomes (1051^{a}5–6, 10–11, 16–17):

[1] Every potentiality is correlated with two outcomes, which are opposed to one another.

The principle is stated very starkly, and is more abstract than the point about opposites at *Θ*8, 1050^{b}30–4 (Commentary, Chapter 8, §13). The general principle [1] does not sit easily with Aristotle's claims in *Θ*2. However, the examples provided to illustrate [1] are carefully chosen so as to finesse the issue of inconsistency with *Θ*2. Aristotle cites some passive capacities (1051^{a}7–10: being healthy and being diseased, remaining at rest and being changed, being built and collapsing), and a single active rational capacity (1051^{a}9–10: building and demolishing). It may be no accident that he avoids the case of active non-rational capacities, which would bring [1] most directly into conflict with *Θ*2 (see Commentary, Chapter 2, §5). The fact that [1] is stated abstractly will be important in connection with Aristotle's arguments at 1051^{a}17–19 (§4 below).

There is an argument, which has some appeal, from [1] to a weak intermediate conclusion:

[3] *If* a potentiality and its two correlated actualities can be evaluated relative to one another, *then* the potentiality should be ranked between the two actualities (the potentiality is neither the best nor the worst of the three).

The general idea is this. Because [1] abstracts from any significant differences between the opposed outcomes, the potentiality is presented as standing symmetrically to the opposed outcomes to

which it can give rise. So any positive value attaching to the potentiality in virtue of its correlation with one outcome will be balanced by a countervailing negative value, attaching in virtue of its correlation with the opposed outcome. But this is not true of the opposed outcomes themselves. Opposed actualities cannot obtain together ($1051^{a}11–12$). Therefore, if one obtains, the other does not. So any value, whether positive or negative, attaching to an actuality is unaffected and undiluted by the contrary value attaching to its opposite. So, if evaluation is appropriate, then the value of the potentiality should be less than the value of one actuality and greater than the value of the other.

Here is an example to illustrate the form of argument. You have a choice between the following:

(*a*) a red £50 token;
(*b*) a blue £50 token;
(*c*) a one in two chance of receiving a red £50 token and a one in two chance of receiving a blue £50 token, the outcome to be decided by the toss of a fair coin.

One colour token represents cheques to be paid to you, the other bills which you have to pay. You do not know which colour represents which. So you do not have enough information to form a complete ranking, since you have no grounds for preferring either of (*a*) or (*b*) over the other. But the argument is that you do have enough information to form a partial ranking. What you are after is cheques, and what you want to avoid is bills. The value in tossing a coin is that it might lead to cheques, the disvalue is that it might lead to bills. But (*c*) stands symmetrically to those outcomes. So one or another of (*a*) or (*b*) is preferable to (*c*) —but you cannot possibly say which. And one or the other is less preferable than (*c*) —but again you cannot say which. One or the other of (*a*) or (*b*) should be assigned a value of $+50$, one or the other a value of -50; but (*c*) should be assigned a value of $(\frac{1}{2} \times +50) + (\frac{1}{2} \times -50)$, which equals 0. So (*c*) should be ranked between (*a*) and (*b*). Option (*c*) corresponds to the potentiality in Aristotle's argument, (*a*) and (*b*) to the opposed outcomes with which it is correlated. The even chances which feature in (*c*) correspond to the thought that the potentiality stands symmetrically to the opposed outcomes.

Since [3] is a conditional, it is a weak conclusion. It involves no presupposition that it makes sense, in the case of any particular

potentiality, to evaluate it and its opposed actualities. That means that we could accept [3], while finessing worries about Aristotle's association of values with the potential–actual schema (recall §2 above). In some cases evaluation does seem appropriate: for example, as regards being healthy, being ill, and being in a condition which is as liable to go one way as the other. And the example (*a*)–(*c*) was deliberately set up in evaluative terms (cheques and bills). But, so far as [3] goes, we can keep an open mind about instances of the potential–actual schema which may not seem evaluable: for example, the passive capacity of water to be heated.

This sort of argument for [3] fits with Aristotle's repeated emphasis on principle [1], that every potentiality is correlated with two opposed actualities (1051^{a}5–6, 10–11, 16–17); it makes use of Aristotle's premiss that opposed actualities cannot obtain at the same time (1051^{a}11–12); and the symmetry considerations underlying it are suggested by 1051^{a}13–14 ('it is necessary for the good to be one of these two, but being capable is in the same way both or neither'). But [3] is only an intermediate conclusion. The next step is to move from [3] to

[Q] [i] If an actuality is good, then it is better than the potentiality with which it is correlated; whereas [ii], if an actuality is bad, then it is worse than the potentiality with which it is correlated.

The move from [3] to [Q] corresponds to the move to a complete ranking in the example (*a*)–(*c*) when one's ignorance is dispelled. If red tokens are cheques, then (*a*) the red £50 token is better than (*c*) the one in two chance of a red £50 token; and, if red tokens are bills, then (*a*) is worse than (*c*). Health is in fact better than illness: so being actually healthy is better than being potentially healthy, and being actually ill worse than being potentially ill. But again [Q] is fairly weak, in that it does not require one to assume, of any particular actuality, that it can appropriately be evaluated.

The argument for [Q] via [3] can be found in Aristotle's text. It is an appealing form of argument; and, because conclusion [Q] is fairly weak, the conceptual costs of accepting [Q] are not too high. However, the argument does rest on the assumptions that any value attaching to a potentiality attaches in virtue of the actualities to which it can give rise, and that opposed outcomes have opposed values. In the absence of those assumptions there would be no grounds for the thought that any values attaching to opposed actualities would

cancel each other out, nor for moving from that thought to the conclusion that any potentiality for opposites will have only mutually cancelling component values attaching to it. The assumptions also show up in example (*a*)–(*c*), when it is taken for granted that the only considerations relevant to assessing the coin-tossing option (*c*) are the actual red or blue tokens to which it can give rise. And any argument for [Q] which rests on an assumption that a potentiality is good (bad) only in so far as it is for a good (bad) outcome is question begging—especially given Aristotle's further view that, if it is in virtue of A's being F that B is F, then A is more F than B (*Met.* α1, $993^{b}24$–7: fire is the hottest thing because it is fire which causes everything else to be hot).

4. $1051^{a}17$–19: The Unqualified Claim about Actuality

What makes the unqualified claim

[U] actuality is better than potentiality

plausible is the principle that one of the outcomes correlated with a potentiality is privileged:

[2] It is the good outcome correlated with a potentiality which is most properly the actuality.

As noted (§2), that principle is in evidence at $1051^{a}17$–19. Aristotle makes two claims:

[4] The bad does not exist in addition to bad things ($1051^{a}17$–18).
[5] The bad is posterior in nature to the potentiality ($1051^{a}18$–19).

Claim [5] is intended to confirm [4]: 'for' at $1051^{a}18$ is explicative. However, it is much easier to find a sympathetic reading for [4] than for [5]. Commentators have struggled to make [5] plausible. So it is probably better to let [4] stand on its own feet.

The gloss offered earlier on [4] was this (§2). The good outcomes correlated with a potentiality instantiate a common form, which is the good to which the potentiality is directed. But, in contrast, there is no single form common to the bad outcomes: there is just the variety of bad outcomes themselves. That difference between the good and bad outcomes correlated with a potentiality provides support for [2]; and it is [2] which allows Aristotle to move beyond [Q], the

qualified claim about the value of actualities and potentialities, which predominates in *Θ*9, 1051^{a}4–17, to the unqualified claim [U].

Claim [5] is puzzling. Suppose [4] is understood as the claim that that there is no single form in common to the bad outcomes of a potentiality, but just the various outcomes themselves. In that case, what [5] must be saying is that it is those bad outcomes which are posterior in nature (that is, *Met.* *Δ*11, 1019^{a}2–4, in substance) to the potentiality. What would justify Aristotle in that claim, given that he has just argued in *Θ*8 (1050^{a}4–1050^{b}6) that actuality is prior in substance (nature) to potentiality?

Commentators have been unimpressed by Aristotle's line of thought. Ross (1924: ii. 268, following Bonitz) accuses Aristotle of equivocation. Lines 1051^{a}15–17 entitle Aristotle to the view that bad outcomes are posterior to potentiality *in value*, but Aristotle slides from that to the distinct view that they are posterior *in nature* (*and substance*). Burnyeat (1984: 150) shares Ross's disquiet. Aquinas understands Aristotle as saying that, because the bad outcomes are worse than the potentiality, they are even further from perfection than the potentiality, and are therefore posterior in nature (*Comm. in Met.* §1886). But it would be preferable to understand [5] in such a way as to integrate it with the interpretation of *priority in substance* in *Θ*8, 1050^{a}4–1050^{b}6. Aristotle's point in [5] is presumably that bad outcomes are posterior to potentiality in the same way that, according to *Θ*8, actuality is prior to potentiality.

Here is a reading of [5] which at least works well for a limited range of cases. Recall the discussion of priority in substance at Commentary, Chapter 8, §6. The actuality, which is the single form instantiated by the good outcomes of a potentiality, is prior in substance because in normal conditions—in the absence of interference—the potentiality leads to that form. For example, in normal conditions, in the absence of interference, the growing child comes to manifest fully the human form (*Θ*8, 1050^{a}5–7). If a potentiality fails to result in its proper actuality, the goal to which it is directed, that is because something prevents it from doing so (recall Commentary, Chapter 5, §10; we can here leave open the question of which factors are possible preventers: according to the strict doctrine of *Θ*5, 1048^{a}16–21, it is only the presence and suitability of agent and patient, while the looser statement at *Θ*7, 1049^{a}5–7, includes external factors too; see Commentary, Chapter 5, §11, and Chapter 7, §4).

However, the situation is different as regards the bad outcomes of a potentiality. They do not instantiate a single form, and do not result from the actualization of a single form. Instead, they are due to interference and hindrance. If the fertilized egg develops not into a human being, but into a non-viable deformed foetus, that is because something has interfered—for example, the egg was contaminated by pollutants (compare *Phys.* 2.8, $198^{a}33–199^{b}7$). So, according to the *Θ*8 account of priority in substance, the bad outcomes will *not* count as prior in nature and substance to the potentiality, since they do *not* result from the potentiality in normal conditions. On the contrary, they are the result of interference. And, since the bad outcomes are not prior in nature and substance to the potentiality, we might well conclude that they are posterior ($1051^{a}18–19$).

That line of argument both supports [5], and explains why [4] and [5] should be connected. The crucial assumption is that the bad outcomes correlated with a potentiality are due to interference. They are not due to the unhindered actualization of a single form. That assumption supports both [4], that there is no single form, in addition to the bad outcomes, which they instantiate; and [5], that the bad outcomes are posterior in nature/substance to the potentiality.

However, the argument is defensible for only a limited range of cases. For the crucial assumption fails to hold of *two-way*, *rational* capacities. It is *not* the case that the bad outcomes correlated with a rational capacity are due to interference. When a wicked doctor puts her medical skill to bad and improper use, what leads her to harm her patients is a particular set of desires and a choice (*Θ*5, $1048^{a}10–13$). But that wicked choice is not something which *interferes* with the exercise of her skill: it is not like adulterated drugs or blunt instruments. If we did think of a doctor's wicked choice as an interfering factor, then, contrary to *Θ*2, there would be no real difference between one-way and two-way capacities, since *all* capacities can lead to opposed outcomes in interfering conditions. What is characteristic of two-way, rational capacities is that they can give rise to opposed outcomes in normal conditions (recall Commentary, Chapter 2, §4). Given that, it follows that the bad outcomes of a rational capacity will count, by the lights of *Θ*8, as prior in substance to the capacity just as the good outcomes do.

Nonetheless, this argument for [5] does have limited success: it will work for any potentiality where desire and choice do not

play a role in activating and directing the potentiality (compare Commentary, Chapter 2, §6 (iii)). And that is a more positive assessment of Aristotle's [5] than is offered by commentators such as Ross. Further, it is unsurprising that [5] should be vulnerable to this objection, given the very abstract statement of the general principle [1]. Even if the examples at 1051^{a}7–10 are carefully chosen to minimize conflict with *Θ*2, Aristotle does not explicitly introduce *Θ*2's *rational/non-rational* terminology. And the absence of that terminology will make it easier to overlook the difference among potentialities which is extremely significant, given *Θ*8's approach to priority in substance. All potentialities can give rise to opposed outcomes. But two-way, rational capacities can give rise to opposed outcomes in normal conditions; while other potentialities give rise to one set of outcomes in normal conditions, and an opposed set due to interference.

5. 1051^{a}19–21: Eternal Things

Aristotle now draws a consequence concerning eternal things. The earlier examples (1051^{a}6–10) included as instances of potentiality both capacities for change (the builder's capacity to build and to demolish) and matter (it is the bricks, which are matter for a house, which can be built; although it is not the bricks, but either the house or the partially finished walls, which can collapse). Aristotle's point about eternal things brings a third instance of the actual–potential schema, the eternal–perishable relation, into view.

The passage 1051^{a}19–21 can be read as building on the point just established

[5] the bad is posterior in nature to the potentiality

and appealing to a result from the preceding chapter: that, if something is eternally (F), then it is not potentially (F) (*Θ*8, 1050^{b}7–8, 16–18; Commentary, Chapter 8, §11). According to the interpretation offered above, [5] rests on the assumption that the bad outcomes of a potentiality are due to interference. But, if something is eternally (F), then its being (F) does not involve any underlying potentiality. So there is no potentiality to be interfered with. And so there cannot be anything bad in what is eternal. Put more crisply: what is bad is posterior to potentiality, so where there is no potentiality there is nothing bad; so there is nothing bad in eternal things.

Two comments on 1051^{a}19–21. First, the fact that the argument involves appeal to a result from *Θ*8 is not inconsistent with seeing *Θ*9 as a folder, relatively unintegrated with the preceding chapters of *Θ* (see §1 above). On the contrary, we would expect points of connection between the material in a folder and the surrounding text, since there needs to be some explanation of why the folder contains just the material it does, and why it is placed where it is in the text. The reason to think of *Θ*9 as a folder is that it lacks an overarching internal structure, and that it does not continue the line of argument from the preceding chapters: we would not be able to tell that something was missing from *Θ* if the book ended with Chapter 8.

Second, there is a related claim at *Met.* *Δ*5, 1015^{b}14–15, that there is nothing due to compulsion or contrary to nature in what is eternal and unmovable (compare *Δ*5, 1015^{a}26–33: compulsion and nature are opposed—a stone moves downwards naturally, but may be compelled to move upwards, against its nature, if thrown). But the supporting argument at *Δ*5 is less developed, and does not appeal to *Θ*8's result that what is eternally (F) is not potentially (F).

6. 1051^{a}21–33: The Geometrical Examples

The second part of *Θ*9 is difficult. The passage concerns geometry. There are a prologue (1051^{a}21–4), two examples (1051^{a}24–6, 26–9), and some explanatory conclusions (1051^{a}29–33). The concluding remarks are particularly dense and telegraphic. I will comment first on the examples (this section), and then on the conclusions Aristotle draws from them (§§7, 8). Finally I will say something about the place of this material in *Met.* *Θ* (§9).

The examples are summary statements of geometrical proofs. The first (1051^{a}24–6) is the more straightforward. The theorem to be proved is that the internal angles of a triangle are equal to two right angles. Euclid's proof at *Elements* I. 32 is as follows. Consider a triangle ABC (Fig. 1). Let the base BC be extended to D, and CE be drawn from C parallel to BA (Fig. 2). The angles BAC and ACE are equal (*Elements* I. 29, alternate angles). The angles ABC and ECD are equal (*Elements* I. 29, corresponding angles). So the two angles BAC and ABC together are equal to angle ACD. The two angles ACD and ACB are angles on a straight line, and so are equal to two right angles (*Elements* I. 13, 1051^{a}24–5). So the internal angles BAC, ABC, and ACB are equal to two right angles.

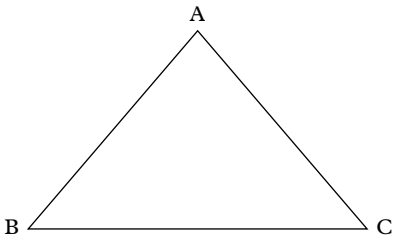

FIGURE 1

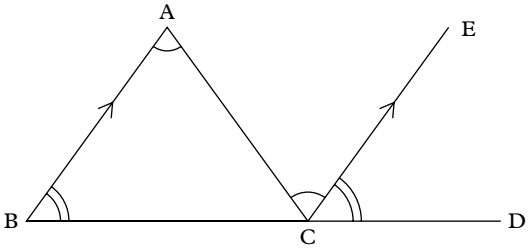

FIGURE 2

There is an alternative non-Euclidean proof (possibly Pythagorean; see Heath 1925: i. 317–21 for discussion). Let a line DE be drawn through the apex A parallel to the base BC (Fig. 3). Angles ABC and DAB are equal (alternate angles). Angles ACB and EAC are equal (alternate angles). So the angles BAC, DAB, and EAC on the straight line DE are together equal to the internal angles BAC, ABC, and ACB. So the internal angles are equal to two right angles.

Which proof does Aristotle have in mind? The first requires two lines to be drawn, the second only one. And at 1051^{a}25–6 Aristotle

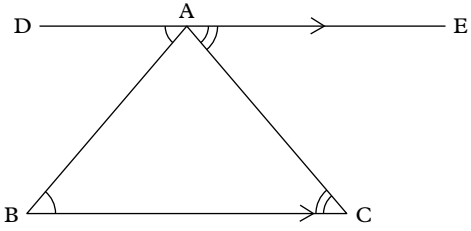

FIGURE 3

mentions only one line, 'the line parallel to the side'. That suggests the second proof. But 'drawn up' at 1051^{a}25 tells against that, since the parallel CE in Fig. 2 is drawn *up*, while DE in Fig. 3 is not. However, that could be accommodated if we take a variant on the second proof, with the parallel DE drawn through C (Fig. 4, suggested at Burnyeat 1984: 150–1).

The second example (1051^{a}26–9) is more opaque. The theorem to be proved (Fig. 5) is that any angle BAC enclosed in a semicircle is a right angle (BC is a diameter, and A any point on the circumference). Aristotle's summary of the proof is extremely compressed. There are three possibilities.

The first is non-Euclidean (see Burnyeat 1984: 148). Let a line be drawn from the centre D to A (Fig. 6). The three lines BD, AD, and CD are equal (radii of the same circle). So the triangles ADB and ADC are each isosceles. So the two base angles DBA and DAB

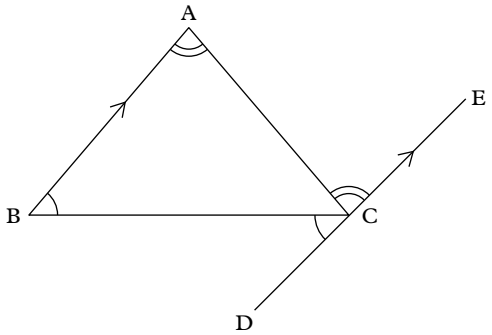

FIGURE 4

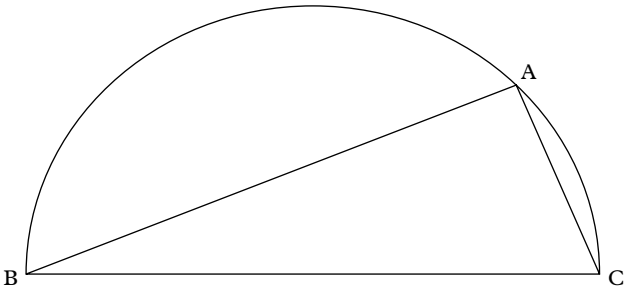

FIGURE 5

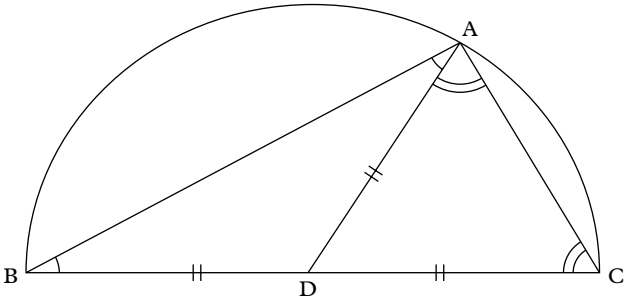

FIGURE 6

of the isosceles triangle ADB are equal (*Elements* I. 5). And the two base angles CAD and ACD of the isosceles triangle ADC are equal. So, in the triangle ABC the total angle BAC is equal to the sum of the two angles ABC and ACB. Those three angles together equal two right angles (*Elements* I. 32; proved in Aristotle's first example). So the angle BAC, enclosed in the semicircle, is a right angle.

The second follows Euclid (*Elements* III. 31). Let a line be drawn from the centre D to A, and let BA be extended to E (Fig. 7). Just as in the first proof, we show that the angle at the circumference BAC is equal to the sum of the two angles ABC and ACB. But the angle EAC is also equal to the sum of the two angles ABC and ACB (*Elements* I. 32, the external angle of a triangle is equal to two opposite internal angles). So the angle BAC is equal to the angle EAC and together

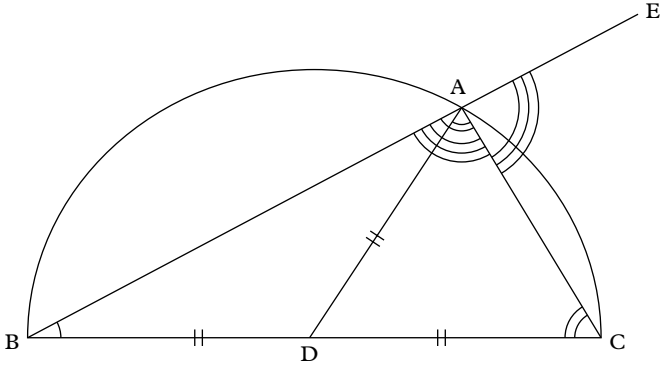

FIGURE 7

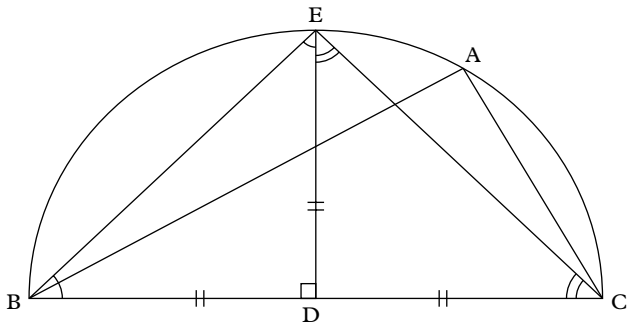

FIGURE 8

they are angles on a straight line. So the angle BAC in the semicircle is a right angle (*Elements* I, def. 10).

The third is attributed to Aristotle by some commentators (Ross 1924: ii. 270–1, Heath 1925: ii. 63–4). Let a line DE be drawn from the centre D perpendicular to the diameter BC (Fig. 8). Lines DB, DE, and DC are all equal (radii of the same circle). So angles DEB and DBE are equal (base angles of the isosceles triangle BDE). And angles DEC and DCE are equal (base angles of the isosceles triangle CDE). So angle BEC equals the sum of the two angles BCE and CBE. All three together are two right angles (internal angles of the triangle BEC). So the angle BEC is a right angle. But any two angles in the same segment of a circle are equal (*Elements* III. 21). So *any* angle BAC enclosed in a semicircle is equal to BEC, and is therefore a right angle.

The indirect approach of the third alternative is striking. It establishes first that a particular angle in the semicircle is a right angle (the angle BEC, with E on a line perpendicular from the centre); and then, second, that any other angle in the semicircle is equal to that angle. Those who recommend this alternative do so in order to accommodate $1051^{a}27$–8: the three equal lines would be BD and DC ('the two which are the base') and ED ('the one dropped straight from the centre', and taken to be a line perpendicular to the diameter). But the interpretation can be avoided if 'the one dropped straight from the centre' means any straight line from centre to circumference (AD in Figs. 6 and 7; recommended by Owen in Burnyeat 1984: 148).

A decision between the first and second alternatives rests on the reference of 'that' at 1051^{a}29 ('it is clear on seeing it to the person who knows that'). It indicates some more basic theorem on which the proof in the second example depends. An appealing reference is the theorem in the immediately preceding example, that the internal angles of a triangle are two right angles; and that is the main theorem on which the first alternative rests. The second alternative requires in addition the theorems that the angles on a straight line are two right angles, and that the external angle of a triangle equals the sum of the two opposite internal angles (*Elements* I. 13, 32). In that case the reference of 'that' would be less determinate.

7. 1051^{a}21–33: What the Examples Show

Aristotle states the point of the examples twice. Immediately following them at 1051^{a}29–30 he says: 'the things which are potentially are discovered when they are drawn out into actuality.' And that repeats the opening at 1051^{a}21–2. 'The things which are potentially' are the constructions which are 'in there potentially' (1051^{a}23–4) before a geometrical figure is divided. Constructions are present potentially in a geometrical figure when division of that figure—joining points, adding lines—takes us to a figure in which the construction is present actually (1051^{a}22–4). The divisions are effected in thought (1051^{a}30–1). A geometer may draw Fig. 1 on the board, then draw a line (roughly) parallel to the base BC and (roughly) through the apex A, and obtain Fig. 3. But she need not do so. She could as well say: 'let a line be drawn through the apex A parallel to the base BC.' Or she may, in the privacy of her study, just think of the line as added. It is the act of thought which is necessary and sufficient for obtaining the construction. Representing constructions as in Figs. 1–8 is just an aid to understanding or communication.

Suppose I want a proof which explains why a particular geometrical fact obtains. For example, *why* are the internal angles of a triangle equal to two right angles (1051^{a}24: on proofs as explanatory, see *An. Post.* 2.11, 94^{a}20–34; *EE* 2.6, 1222^{b}31–7)? Aristotle claims that certain constructions will make the explanatory proof immediately clear (1051^{a}26, 28–9). Is that a plausible claim?

There are two ways of taking the idea that a geometrical proof involves at some stage an immediate insight. One concentrates on a very appealing candidate for the object of immediate insight:

basic axioms. Euclid's proofs rest on theorems which have been proved earlier in the *Elements*, and they depend ultimately on the axioms, definitions, and common notions. Those starting points have to be accepted on the basis of an intuitive insight, rather than further argument (compare *An. Post.* 2.19, 100^{b}5–16, and *EN* 6.6 on *nous*: comprehension or understanding). However, the particular examples Aristotle provides are not a very good illustration of the (plausible) thought that geometrical axioms have to be accepted through immediate insight, without further argument. Notice first a difference between the two examples. In the second, the construction makes the explanatory proof clear only to someone who already knows a further geometrical theorem (1051^{a}28–9: 'it is clear on seeing it to the person who knows that': most plausibly, that the internal angles of a triangle are equal to two right angles). In contrast, in the first example Aristotle simply says that the construction makes the explanatory proof clear, without further qualification (1051^{a}25–6: 'it would have been clear immediately on seeing it'). Now, as regards the second example, it is certainly true that any proof that the angle in a semicircle is a right angle *will* rest on the theorem that the internal angles of a triangle are equal to two right angles. But it is equally true, as regards the first example, that any proof that the internal angles of a triangle are equal to two right angles will rest on the theorem that alternate angles are equal. In neither of the examples do we have anything which is plausibly an immediate insight into Euclidean axioms. Maybe we should abstract from the content of the examples, and take them as illustrating only a logical point: that, while some constructions will make a proof immediately clear, others will do so only in the light of further theorems. But, in that case, the connection with an immediate insight into geometrical *axioms*, on the basis of which they can be accepted without further argument, is lost. If intuitive insight is the epistemological guarantee of an axiom, then it is unnecessary to appeal—as in these examples—to constructions to explain why the axiom holds.

The plausible view that geometry rests ultimately on underived axioms is not the only way of cashing out the idea that proof involves immediate insight. An alternative connection is with the thought that geometrical proof deals with *particulars*. For example, in proving that the internal angles of a triangle are two right angles, we consider *the* (particular) construction represented in Fig. 2 (note the reference to particulars at *An. Post.* 1.1, 71^{a}19–24,

though compare *An. Post.* 1.13, 79^{a}7–10). Just as sense perception makes us aware of sensible particulars, so too the thinking by which the geometer joins points, extends lines, and so actualizes constructions involves a quasi-perceptual insight into mathematical objects. There may be a connection here with *Met. Z* 10, 1036^{a}2–12: there are individual sensible circles (for example, made of wood and bronze) and individual intelligible circles (mathematical circles), the former known by means of perception, the latter by means of thought.

Aristotle refers elsewhere also to the idea of a quasi-perceptual intuition involved in geometry. But none of the passages is straightforward. At *EN* 6.8, 1142^{a}23–30 he says that practical wisdom (*phronêsis*) involves the same sort of quasi-perceptual awareness that is found in geometry. The example he gives is difficult: 'the last among mathematical objects is a triangle' (1142^{a}28–9). One possibility is that he is referring to the process of analysis by which a geometer works back from a theorem to be proved to the immediately obvious first step of a construction from which the proof will then flow: 'if I draw those lines then I will have a *triangle*, and then it will follow that . . . and then that . . . and then I will have my proof' (compare *EN* 3.3, 1112^{b}20–4). In that case there would be a connection with *Θ*9. The point in *Θ*9 would be that there are some simple and basic constructions with which the geometer starts her proofs (such as the first example), while the constructions involved in other proofs rest on the successful grasp on simpler figures (the second example). But this may be forced, and the *EN* 6.8 example admits of other interpretations: for example, as the recognition that the figure before me is a triangle; or the recognition of a geometrical fact concerning triangles, that they are the basic rectilinear shape into which any other rectilinear shape can be decomposed (compare also *EN* 6.11, 1143^{a}35–1143^{b}5; and for discussion Woods 1986).

It is the fact that Aristotle thinks that certain constructions will make a proof immediately clear which explains why he says that constructions are 'discovered' when the appropriate lines are added in thought (1051^{a}21–2, 23, 30). In the case of any particular theorem, what is wanted is a construction which makes it immediately clear (with or without additional background claims) why the theorem holds. For example, we want to explain why the internal angles of a triangle are equal to two right angles. Then any of the constructions in Figs. 2–4 will be appropriate, while a construction which

inscribes triangle ABC in a semicircle (Fig. 5) will not be. A geometer can tell whether some candidate construction does make the required proof clear only when she surveys it; and so she will find the construction she wants only by effecting the divisions which render the construction actual.

There is an intellectual skill in knowing which divisions to effect in order to actualize the right construction to prove a given theorem. Aristotle does not mention it here, but comments elsewhere on *acumen*: the ability to get the correct middle term for a syllogistic explanation quickly (*An. Post.* 1.34: according to *MM* 1.5, $1185^{b}5$, this is a virtue of rationality, but *Nichomachean Ethics* 6.9, $1142^{b}2$-6 says that acumen is a type of skill in conjecture, and then distinguishes skill in conjecture from good deliberation on the grounds that skill in conjecture does not involve reasoning and occurs quickly). There is presumably a dual to the expert who displays acumen in hitting on the right constructions for a given proof: namely, the poor geometer who wastes time thinking about unhelpful constructions. At *Top.* 1.1, $101^{a}5$–17, Aristotle describes 'the man who draws a false figure'. He derives a false conclusion by reasoning from assumptions which are false, but appropriate to the subject matter: for example, he circumscribes semicircles wrongly or draws lines in a way that they should not be drawn (*Top.* 1.1, $101^{a}13$–17). But this character from *Top.* 1.1 is more mysterious than the incompetent who muddles around with constructions which are useless for proving some particular theorem. If I think about the wrong construction, I will not be able to prove that the angle in a semicircle is a right angle. But it is not clear how thinking about the wrong construction will lead me to suppose I have proved geometrical claims which are *false*. Compare also *Top.* 8.1, $157^{a}13$: while adding unnecessary complexities to a construction may hinder me in coming up with a proof, it is less clear how they could hide a geometrical *error* (see Heath 1949: 76–8).

8. $1051^{a}29$–33: Epistemic Priority

What further conclusion are we to draw from the point directly illustrated by the examples? Aristotle's discussion here is particularly opaque. Here are five related problems:

(*a*) The sentence $1051^{a}31$ ('so that the potentiality . . .') lacks a verb. So something has to be understood from what precedes.

There are two options. One is that the sentence picks up the verb *discovered* from 1051^{a}30 (as in Barnes 1984: 'so that potentiality is discovered from actuality'). The other alternative is to understand something like *comes to be*, and to read the sentence in the light of the principles about coming-to-be at *Θ*8, 1049^{b}24–5, 28–9 (principles [A] and [B] at Commentary, Chapter 8, §4); thus Ross 1928: 'so that the potency proceeds from an actuality'.

(*b*) Whichever verb is understood, the sentence seems awkward. Constructions are found when they are present actually, not potentially (1051^{a}21–2). And, according to *Θ*8, 1049^{b}24–5, what is actually F comes from what is potentially F, and not vice versa (compare *Met.* *Z*7, 1032^{a}17; *Z*8, 1033^{a}25–6; *Λ*2, 1069^{b}15–17).

(*c*) How does 1051^{a}30–1 *explain* what has gone before ('the explanation is that . . .')?

(*d*) It is appealing to take the rest of that sentence ('thinking is the actuality') as referring to a geometer's actual thinking, in contrast to his unexercised geometrical knowledge (his ability to think). In that case there are two items in view throughout this passage which are actualities: the actual construction (e.g. Fig. 3) and the geometer's actual thinking. And so there is a question about which actuality is referred to at 1051^{a}31 ('the potentiality is from actuality'). Similarly, it may not be clear whether the point at 1051^{a}29–30 ('when they are drawn out into actuality') is that potential constructions are brought into actuality (that is, actualized) or that they are brought to be objects of actual thinking.

(*e*) The closing 1051^{a}32–3 ('the individual actuality . . .') marks a qualification. But what contrast is at issue?

The best understanding of 1051^{a}29–33 as a whole starts from answering (*a*) by supplying *discovered* for 1051^{a}31 from 1051^{a}30. The sense of 1051^{a}29–31 is: 'particular potential constructions are discovered to be the ones relevant to a given proof when they are actualized . . . and so the potential constructions are discovered from actuality.' As regards (*b*), 'from' is not meant in the same sense as in the principles about coming to be at *Θ*8, 1049^{b}24–5 (the adult who is actually human comes *from* a fertilized egg, which is potentially human). At 1051^{a}31 it has the instrumental sense

through or *by means of*: for example, his lowly birth was evident *from* his poor table manners (compare *An.* 3.7, 431^{a}3–4, which says that everything which comes to be comes to be *from* what is actually, where we might have expected *by means of* what is actually). That encourages the thought that *Θ*9, 1051^{a}21–33, should not be tied too closely to the discussion of temporal priority at *Θ*8, 1049^{b}17–1050^{a}3 (see further §9 below); and dovetails with the decision to understand *discovered* rather than *comes to be* at the verbless 1051^{a}31.

If 1051^{a}31 picks up *discovered* from 1051^{a}30, then the intervening 'the explanation is that thinking is the actuality' is a passing gloss on what precedes. In answer to (*c*), it provides an explanation in the following way. An expert geometer has the intellectual ability to recognize the right construction for a particular proof: for example, the ability to recognize that, in order to prove that the internal angles of a triangle are equal to two right angles, it would be appropriate to extend the base BC in Fig. 1 to D and to draw CE from C parallel to BA. Suppose she exercises that ability. She will do some actual thinking: she will actually think of the base BC in Fig. 1 as extended to D, and of CE as drawn from C parallel to BA. She has thereby actualized the construction Fig. 2 which was present potentially in Fig. 1, since what is necessary and sufficient for a construction to be actualized is joining points and adding lines *in thought*. So it is because the geometer's thinking is actual thinking that a potential construction is actualized, and discovered to be the one required for a particular proof.

We now have an answer to (*d*). Both 1051^{a}29–30 ('drawn out into actuality') and 1051^{a}31 ('is from actuality') refer to the actual construction: for example, what is represented in Fig. 2. The connection with the geometer's actual thinking (1051^{a}30: 'the explanation is that'; 1051^{a}31: 'so that') is that a construction is rendered actual by actual thinking: namely, actually joining these points and adding those lines in thought, rather than having the ability to join the right points and add the right lines for the proof in question.

Finally (*e*). 'The individual actuality' refers to the actual construction. A literal translation would be 'the actuality in respect of number'. That odd phrase is apt because an actual construction is a single individual construction, as represented by Fig. 2, for example. As Aristotle says, this is posterior in coming to be to the construction in which it is present only potentially (Fig. 1). The geometer starts with Fig. 1, and then his thinking of BC as extended to D and CE

as drawn from C parallel to BA takes us from Fig. 1 to the actual construction represented in Fig. 2. What contrast is Aristotle marking when he says that the actual construction in Fig. 2 is posterior in coming to be to Fig. 1? There are two options. One is that, while the actual construction is posterior *in coming to be*, it is prior *in some other respect*. The other is that, while *the actual construction* is posterior in coming to be, *something else* is prior in coming to be.

The first option is preferable, and fits with the decision to answer (*a*) by supplying *discovered* for the verbless sentence at 1051^{a}31. Aristotle's point is that the actual construction is epistemically prior. I know something about a construction present potentially in Fig. 1—namely, that it is relevant to proving that the internal angles of a triangle are equal to two right angles—because I know something about the actual construction represented by Fig. 2: namely, that when I see that construction, it is immediately clear why the internal angles of a triangle are equal to two right angles (1051^{a}25–6). But, while the actual construction is epistemically prior, it is posterior in coming to be. The contrast is between two types of priority.

Note that it would not be possible to take the contrast in this way had the response to (*a*) been different. If we understand *coming to be* in the verbless sentence at 1051^{a}31, rather than *discovered*, then the point would have to be as follows. 1051^{a}31: the potential construction comes to be from (that is, actualized by means of) the geometer's actual thinking (this would involve answering (*d*) differently: 'from actuality' at 1051^{a}31 would refer to actual thinking). So the actual thinking is prior to the transition from potential to actual construction, whereas the actual construction is posterior. On this reading the contrast is between two types of actuality. (For example, Ross 1924: ii. 273: 'the potentiality of the construction presupposes the activity of thought, but precedes the actuality of the construction.')

So the general moral of the second half of *Θ*9 is that, in the particular case of geometrical constructions, actuality is epistemically prior to potentiality. But the geometrical case is a slippery one, and needs to be treated with caution. It would be dangerous to overemphasize the similarity between the geometer and the more familiar case of a builder or doctor. A builder starts with some materials which are potentially a house (*Θ*7, 1049^{a}8–11) and then by an exercise of his building skill produces something which is actually a house.

The manufacture is a stage-by-stage temporal process (first foundations, then walls, then roof timbers). The case of the geometer is only superficially similar. We may say that the geometer *makes* an actual construction (1051^{a}31–2), and that the construction *comes into being* (1051^{a}32). But the significant relation between the construction present potentially (Fig. 1) and present actually (Fig. 2) is an atemporal logical relation (*Cael.* 1.10, 279^{b}33–280^{a}10). The geometer does not 'draw out the construction into actuality' by a temporally structured process: he does not extend the base BC to D and add CE parallel to BA in any particular order. Talk of the geometer *discovering* and *making* is just a vivid way of bringing out the point that it is the construction which is actually present (for example, Fig. 2) that renders the explanatory proof of a theorem immediately clear.

9. The significance of 1051^{a}21–33

I said earlier that we should think of *Θ*9 as a folder (§1). Each part of the chapter makes a point about the priority of actuality: the first half about evaluative priority, the second half about epistemic priority. That connection with the argument up to *Θ*8 is sufficient to explain why these blocks of material should be placed in a folder at this point in *Θ*. But, in addition, the second half of the chapter introduces two important new ideas.

One is the striking reference to the actuality of thinking (*noêsis*) at 1051^{a}30. The only other references to thinking in *Θ* are two illustrations of the present–perfect test at *Θ*6, 1048^{b}24, 34, and *Θ*10, 1051^{a}31–2, 1052^{a}1, 3, where the subject is truth rather than the actual–potential schema. The comment in *Θ*9 raises issues which will become important for the project pursued in the later chapters of *Met.* *Λ*, when Aristotle considers the unmoved mover whose activity is thinking, and the problems connected with the claim that its thinking is thinking of thinking (*Λ*9, 1074^{b}33–5: see *Λ*7, 1072^{a}24–32, 1072^{b}14–30; *Λ*9, 1074^{b}15–1075^{a}5). These are extremely difficult matters. The point here is just to note the significance of the connection signalled at *Θ*9, 1051^{a}29–33, between the actuality of thinking and the actuality of the geometrical construction (for my gloss on that connection, see discussion of problem (*c*) at §8 above).

The other significant move in the second half of *Θ*9 is the introduction of a new instance of the potential–actual schema: the

relation between constructions which are present potentially and constructions which are present actually. This is quite different from the relations of capacity to change or matter to substance (*Θ*6, 1048^{b}8–9). Geometry does not involve change. And, while Aristotle does occasionally mention the mysterious notion of intelligible matter, it is not in play in *Θ*9, 1051^{a}21–33 (on intelligible matter see *Met.* *Z*10, 1036^{a}9–12; *Z*11, 1036^{b}32–1037^{a}5; *H*6, 1045^{a}33–1045^{b}2; and the reference to the matter of mathematical objects at *K*1, 1059^{b}15–16; for further discussion, see the comments on these passages in Ross 1924). And the relation of perishable to eternal things (*Θ*8, 1050^{b}6–1051^{a}2) is not at issue either.

What gains are there in bringing geometrical constructions under the potential–actual schema? Here is one (purely speculative) problem. I am to prove that the internal angles of a triangle are equal to two right angles. I start as follows. Let ABC be a triangle (Fig. 1). Then let the base BC be extended to D and CE be drawn from C parallel to BA (Fig. 2). Grant Aristotle his claim (1051^{a}26) that seeing Fig. 2 makes something immediately clear. *What* is it that is made clear? Presumably, that, because of certain equalities between angles, and the angle on a straight line being equal to two right angles, it is clear that the three angles ABC, ACB, and BAC in Fig. 2 are equal to two right angles.

But now suppose someone objects as follows. 'Your task was to prove that the internal angles of a *triangle* are two right angles. But the construction in Fig. 2, which made certain geometrical relations clear, is *not* a triangle. It is a strange construction with no special name. For convenience call it a zed-line (it looks like a zed BACE resting on a straight line BCD). I allow that you have proved that the three enclosed angles in a zed-line are equal to two right angles. And, since a zed-line contains a triangle as a part, you have also proved that the internal angles of a *triangle which is part of a zed-line* are two right angles. But how can the construction represented in Fig. 2 (a zed-line), whatever it makes clear, establish a geometrical property of *triangles as such* (i.e. the construction represented in Fig. 1)? The problem is that the constructions represented in Fig. 2 and Fig. 1 are *not the same construction*.'

The move in the second half of *Θ*9 provides a response. The relation between the constructions (triangle, zed-line) is an instance of the potential–actual schema. There is a construction present

actually in the zed-line represented in Fig. 2 which is present potentially in the triangle represented in Fig. 1 ($1051^{a}21–4, 29–30$). The objection posed a dilemma. On the one hand, if the constructions in Fig. 1 and Fig. 2 are simply identical, then it is unclear what the geometer gains in her proof by extending BC to D and adding CE parallel to BA. On the other hand, if they are simply distinct, then it is unclear why a proof sustained by the construction in Fig. 2 should establish something about the construction represented by Fig. 1. The response is modelled on the treatment in *Met. H*6 of the structurally similar problem concerning the relation of form and matter in perishable substances (Introduction, §6). We steer between the limbs of the dilemma. The constructions are neither simply identical nor simply distinct. To parallel *Met. H*6, $1045^{b}18–19$: the constructions represented by Figs. 1 and 2 are one and the same, the one (Fig. 1) potentially and the other (Fig. 2) actually.

CHAPTER 10

1. An Overview of the Chapter

Chapter 10 is concerned with a new topic: truth and falsity. A concern with this topic fits with the classification at *Met.* $\Delta 7$ and $E2$ ($1026^{a}33–1026^{b}2$) of four ways in which things are said to be: accidental being, being as divided by the categories, being as potential and actual, being as true and false. $\Theta 1–9$ concentrate on potential and actual, $\Theta 10$ and $E4$ on truth and falsity (see Introduction, §2). While the treatment in $E4$ is brief ($1027^{b}33–1028^{a}4$), it does promise a later discussion ($1027^{b}28–9$). It is natural to take $\Theta 10$ as the reference.

The most important points made in $\Theta 10$, around which the chapter is structured, are also found in $E4$. Truth and falsity are properties of thought ($E4$, $1027^{b}25–7$; $\Theta 10$, $1051^{b}3–5$); whether thoughts are true or false depends on the combination and separation of things in the world ($E4$, $1027^{b}18–20$; $\Theta 10$, $1051^{b}2–3, 6–9$); this account of truth and falsity will therefore not apply to worldly items which do not exhibit combination and separation ($E4$, $1027^{b}27–8$; $\Theta 10$, $1051^{b}17–1052^{a}4$).

$\Theta 10$ starts by summarizing different notions of being ($1051^{a}34–1051^{b}2$: the list omits accidental being, but otherwise corresponds to *Met.* $\Delta 7$). Aristotle then gives an account of truth and falsity as properties of thoughts, depending on the division or combination of items in the world ($1051^{b}2–5$). I will refer to this as the Standard Account. The rest of the chapter is structured round questions raised by the Standard Account.

First, the more straightforward case ($1051^{b}6–17$). The main issue here is the distinction between statements/beliefs which can have different truth values at different times ($1051^{b}13–15$), and those whose truth value is invariant over time ($1051^{b}15–17$). Aristotle returns to this second class of statement at the end of the chapter ($1052^{a}4–11$). He there considers whether, even though their truth values are invariant over time, they may not, at least in some cases, vary in other respects ($1052^{a}8–9$: however, the interpretation of this whole passage is disputed).

Second, the more difficult case: what Aristotle calls the *incomposites* ($1051^{b}17–1052^{a}4$). The Standard Account does not apply in

this case, since there is no division or combination (1051^{b}18–21). Aristotle's view seems to be that we can characterize an alternative account of *truth* which will apply to incomposites (1051^{b}24, 1052^{a}1), but that there is no correlative account of falsity (1051^{b}25, 1052^{a}1–2). This is a more nuanced position than that adopted in *Met.* *E*4 (1027^{b}25–8, neither truth nor falsity: compare *Cat.* 4, 2^{a}8–10; *An.* 3.6, 430^{b}26–30). But the passage is difficult. Since there is disagreement about what Aristotle means by *incomposites*, the precise structure of the argument is extremely unclear.

2. 1051^{a}34–1051^{b}6: The Standard Account

The opening lines (1051^{a}34–1051^{b}2) call for little comment. The phrase *in the most proper way* at 1051^{b}1 is strange. It seems clear that truth and falsity are not the most proper notions of being and not-being. At *Met.* *E*4, 1027^{b}29–31, being as truth and falsity is contrasted with being in the proper sense; it is the secondary status of being as truth and falsity which explains why that notion occupies only two chapters (*E*4, *Θ*10), while the whole of *Z* and *H* are devoted to categorial being, and *Θ*1–9 to being as potentiality and actuality. Ross (1924: ii. 274–5) excises the phrase. I have translated so that the reference is to the Standard Account of truth and falsity which follows immediately (1051^{b}2–5). But, while that is a possible reading of the Greek, it is admittedly awkward.

The Standard Account is that truth consists in the correspondence of a truth-bearer to the world (1051^{b}3–4), falsity in a truth-bearer's not corresponding to the world (1051^{b}4–5). The structure of the account is given at *Met.* *Γ*7, 1011^{b}25–8: truth is saying of what is the case that it is the case, or of what is not the case that it is not the case; falsity is saying of what is the case that it is not the case, or of what is not the case that it is the case. So the Standard Account will involve two types of item: cognitive/linguistic (1051^{b}13–14: both statements and beliefs are truth-bearers), and worldly. Aristotle does not go into detail about these here. He refers to the worldly truth-makers neutrally as *things* (1051^{b}2), and does not say much about the structure of the truth-bearers. He says more elsewhere.

It is affirmations and negations which are truth-bearers, the first affirming something of something, the second denying something of something (*Int.* 6, 17^{a}25–6; *An. Pr.* 1.1, 24^{a}16–20; *An.* 3.6, 430^{b}26–7). There are significant sentences which do not make

any statement, and are neither true nor false (*Int.* 4, $16^{b}33–17^{a}4$: for example, a prayer). And there are significant parts of language below the sentential level, which are themselves neither true nor false (*Cat.* 4, $2^{a}4–10$; *Cat.* 10, $13^{b}10–11$; *Int.* 1, $16^{a}12–16$; *Int.* 5, $17^{a}17–20$: for example, a name or a verb in isolation makes no statement, and is neither true nor false). It is a difficult question just how a similar story applies to thought and belief, although Aristotle is confident that it does (*An.* 3.6, $430^{a}27–31$; *Met.* *E*4, $1027^{b}25–7$, 29–33: for example, it is less clear what are the sub-propositional components of unexpressed thoughts). And it is equally difficult to explain precisely how components, whether linguistic or cognitive, are unified into something of the right structure to constitute a statement: *An.* 3.6, $430^{b}5–6$, says simply that this is the result of thought, *Met.* *E*4, $1027^{b}23–5$, finesses the question. (For more on the composition of sentences, see *Int.* 1–6 and the comments in Ackrill 1963; compare also Plato's account of falsity at *Sophist* 261d–264c, and, for discussion, Denyer 1990: ch. 9.)

What about the worldly truth-makers? At *Θ*10, $1051^{b}2–3$, Aristotle mentions combination and division. This could cover two types of case. First, individuals combined with or divided from properties: for example, Theaetetus combined with the property *sitting* and divided from the property *flying* (Plato, *Sophist* 263a). Secondly, properties combined with or divided from one another: for example, the property *horse* combined with the property *domesticated* and divided from the property *yellow*.

According to *Met.* *E*4, $1027^{b}20–4$, an affirmation is true if the appropriate worldly items are combined (for example, 'Candy is pale' is true if Candy and pallor are combined), and a negation is true if the appropriate worldly items are divided (for example, 'horses are not yellow' is true if horse and yellow are divided); contrariwise for falsity.

Met. *E*4 and *Θ*10 emphasize that truth and falsity are features of cognitive or linguistic items (*E*4, $1027^{b}25–7$; *Θ*10, $1051^{b}3–5$; as *An.* 3.6, $430^{b}26–7$). This is preferable to the different view found in the chapter on falsity at *Met.* *Δ*29. According to *Δ*29, $1024^{b}17–21$, your sitting is false when you and sitting are not combined, and the diagonal of a square being commensurable with the side is always false, because being a diagonal and being commensurable are never combined (see Kirwan 1971 for comment).

3. 1051^{b}6–17: The Straightforward Case

The discussion in *Θ*10 concentrates on two main questions thrown up by the Standard Account of truth and falsity (1051^{b}5–6). The first concerns the sorts of case to which the Standard Account applies more straightforwardly. In these cases there is combination and division of worldly items, and the distinction on which Aristotle focuses is that between items which (1051^{b}9–11)

(*a*) are always combined, and cannot be divided;
(*b*) are always divided, and cannot be combined;
(*c*) can be sometimes combined, sometimes divided.

Truth-bearers have the truth values they do as a result of the world being as it is (1051^{b}6–9; also *Cat.* 12, 14^{b}14–22). So there will be a distinction among truth-bearers corresponding to the distinction (*a*)–(*c*) among worldly truth-makers. (*Met.* *Δ*29, 1024^{b}18–21, also marks the distinction (*b*)–(*c*) between what cannot be combined and what merely is not combined: (*a*) is missing from *Δ*29, because the chapter concerns falsity and not truth).

Corresponding to (*c*) are truth-bearers which have different truth values at different times (1051^{b}13–15). Candy is sometimes combined with sitting, sometimes divided from sitting; and so the statement or belief that Candy is sitting is sometimes true and sometimes false. The contrast with cases (*a*)–(*b*) at 1051^{b}15–16 suggests that a truth-bearer can *come to be* true and *come to be* false at different times. It would follow that truth-bearers persist through time. Aristotle says more about this at *Cat.* 5, 4^{a}17–4^{b}19. He claims there that only a substance can have contrary properties at different times: for example, Candy, who is seated at 11.00 and standing at noon. But he then considers the objection that a statement or belief too can be true at one time, false at another: 'Candy is seated' is true at 11.00 and false at noon. He makes two responses, both appealing to the same point about truth-bearers: that they have the truth values they do because of the state of the world (4^{a}35–6, 4^{b}8–10). The first (4^{a}28–4^{b}5) allows that a truth-bearer does have contrary properties at different times, but denies that that purely relational variation constitutes a *change* in the truth-bearer. The change occurs in (the substances in) the world, and not in the statement about the world; and so there is a significant difference in the way in which substances and truth-bearers have contrary properties at different times. The

second response ($4^b5–16$) is more radical. Since a statement's truth value is a purely relational feature, entirely fixed by the state of the world, it is not really the statement but the world which has contrary properties at different times (compare the downgrading of being as truth and falsity, as derivative of and dependent on categorial being, at *Met.* *E*4, $1027^b29–1028^a2$). But in neither response does Aristotle deny that genuine truth-bearers persist through time (for example, by distinguishing between atemporal sentence types and their temporally located tokens). Aristotle does not seem to feel any pressure towards such a move, and it would be impossible for him to make the points he wants at *Θ*10, $1051^b6–17$ and $1052^a4–11$, if truth-bearers did not persist through time.

The truth-bearers corresponding to (*a*) and (*b*) in contrast have the same truth values at all times ($1051^b15–17$). Why does Aristotle draw attention here to the distinction, which seems fairly straightforward, between truth-bearers which do and those which do not vary their truth value across time? He is preparing the ground for the discussion at the end of the chapter ($1052^a4–11$). He will there consider whether truth-bearers whose truth value is temporally invariant, corresponding to (*a*)–(*b*), may nevertheless admit a sort of variation in other specific respects, and therefore be the objects of a certain form of mistaken belief (see also §4 below, and §8 for detailed comment).

4. $1051^b17–1052^a4$: The Incomposites

Before that discussion, however, we have the second main problem generated by the Standard Account of truth and falsity. The very general structure of the problem is fairly clear. The Standard Account applies only in cases which satisfy two conditions: that there are truth-*bearers* of a certain complex structure (semantically significant units combined into affirmations and negations); and that there are truth-*makers* of a certain complex structure (appropriate worldly components combined and divided in various ways). If either of those conditions fails, then the Standard Account will not apply. The question would then arise whether, and in what sense, we should speak of truth and falsity in such cases.

There are different ways in which one or another of these conditions could fail. For example, the putative truth-bearer might be semantically deviant ('numbers walk tunelessly'), or it might not

have the structure of an affirmation or denial ('please pass the salt'). A sentence might refer to an object which is no longer in the world to be combined with or divided from anything (Socrates no longer exists, Santa Claus has never existed: so what about the sentences 'Socrates is healthy' and 'Santa Claus has a beard'?). Some of these cases Aristotle shows no interest in (he says nothing about weird pseudo-grammatical combinations like 'numbers walk tunelessly'). Others he does discuss (for example, *Cat.* 10, $13^{b}12$–35: since Socrates does not exist, 'Socrates is healthy' and 'Socrates is sick' are both false, while 'Socrates is not sick' and 'Socrates is not healthy' are both true: for Aristotle's sensitivity to issues concerning the scope of negations, see *Int.* 10–14 and *An. Pr.* 1.46).

Now the discussion at *Θ*10, $1051^{b}17$–$1052^{a}4$, concentrates on a particular type of case in which these conditions fail. Aristotle calls these *the incomposites* ($1051^{b}17$).

This covers both linguistic/cognitive items which fail to exhibit the right compositional complexity to be affirmations or negations, and worldly items which are insufficiently complex to be combined or divided. While the details of his discussion are opaque, the core point is that the complexity required by the Standard Account is lacking. What should we say in these cases? Aristotle identifies two questions at $1051^{b}17$–22. Are there correlates of truth and falsity (for the sake of convenience I will call these *quasi-truth* and *quasi-falsity*)? And are there correlates of the worldly combination and division in which they are grounded?

Aristotle's answers are striking: there is a correlate of truth ($1051^{b}24$–5, $1052^{a}1$), but no correlate of falsity ($1051^{b}25$–6, 27–8, 31–2, $1052^{a}1$–2). This is striking for two reasons. First, it is not in line with what Aristotle says elsewhere about what seems to be the same sort of case: according to *Met. E*4, $1027^{b}27$–8, there is neither true nor false thought about *simple things and essences* (although *An.* 3.6, $430^{b}26$–9, is less clear). Second, we would expect truth and falsity to be duals, and so we would expect there to be correlates of both or of neither: I will say something below about Aristotle's reasons for taking a different attitude to quasi-truth and to quasi-falsity in this case.

Another preliminary point. I said earlier (§3 above) that the material at the end of *Θ*10 ($1052^{a}4$–11) builds on ideas introduced in the discussion of the more straightforward application of the Standard Account, at $1051^{b}6$–17. If that is so, why does the discussion of

incomposites occur where it does in the chapter, and interrupt the connection between 1051^{b}6–17 and 1052^{a}4–11? (The fact that the connection is interrupted leads some commentators to deny that the topic of 1052^{a}4–11 is picked up from 1051^{b}6–17.) The reason is that it is in the course of the discussion of incomposites at 1051^{b}17–1052^{a}4 that the notion of *being mistaken* is introduced (1051^{b}25–6, 27–8, 31, 1052^{a}1–2). Being mistaken is connected with falsity: I am mistaken about a worldly item if I say or think something (quasi)-false about that item. And it is the notion of being mistaken which is central to the treatment of temporally invariant truth-bearers at 1052^{a}4–11: the important point there concerns the distinction between being mistaken *in respect of time* (1052^{a}4–5) and being mistaken in other respects (1052^{a}8–9; see §8 below for detailed comment).

5. 1051^{b}17–25: The Linguistic Side of the Truth Relation for Incomposites

Aristotle asks two questions at 1051^{b}17–18: a question about being ('what is it to be or not to be?'), and a question about truth ('and what is truth and falsity?'). This is in line with the earlier treatment of the straightforward case, where we were given the Standard Account of truth and falsity (1051^{b}3–5), and an account of being and not-being for the relevant truth-makers (1051^{b}11–13: 'to be is to be combined . . . not to be is not to be combined'). So we would expect the discussion of incomposites also to take up the issues of truth/falsity and of being/not-being. This expectation is reinforced at 1051^{b}18–22: Aristotle says that neither the account of being/not being, nor the account of truth/falsity, given earlier will apply in the case of incomposites. At 1051^{b}22–33 he focuses on truth/falsity, while 1051^{b}33–1052^{a}4 is a briefer treatment of being/not-being.

The statement at 1051^{b}23 ('there is truth or falsity in the following way') signals the start of Aristotle's discussion of whether there are correlates to truth and falsity in the case of incomposites. Truth as defined by the Standard Account concerns a relation between linguistic/cognitive items and worldly items. So, in discussing whether there is a correlative notion of quasi-truth in the more mysterious case of incomposites, Aristotle will need to say something *both* about linguistic incomposites (whether they can be quasi-true and quasi-false) *and* about incomposites in the world (what these items are).

The Standard Account of truth and falsity has considerable intuitive appeal. But how should we decide whether it is reasonable to apply less natural and intuitive notions of *quasi*-truth or *quasi*-falsity to linguistic incomposites which do not fall under that more straightforward account? The best approach is to start from a very broad positive notion of *being right*. Truth as defined by the Standard Account is what being right amounts to in the case of affirmations and negations. And there are correlates of this very broad notion in other cases (compare *EN* 6.2, 1139^{a}21–2, 27–31, on thought and desire). So the question to consider is whether there are such things as being right and/or being wrong in the case of the linguistic incomposites, where those ways of being right and/or being wrong share enough significant features with truth and falsity to count as quasi-*truth* and quasi-*falsity*?

What are the linguistic incomposites about which this question should be raised? There are two main alternatives:

[A] sub-sentential linguistic items, with no propositional structure at all: individual terms or predicates such as 'wood' and 'white', as opposed to 'the wood is white' (suggested by 1051^{b}20–1);
[B] linguistic items which do have propositional structure, but not of the type required by the Standard Account; they would be sentences, but would not count for Aristotle as affirmations or negations.

[A] If the linguistic incomposites are predicates, then it is easy to see that the Standard Account of truth and falsity will not apply to them taken by themselves. But it is not easy to see why Aristotle should take a different attitude to quasi-truth and to quasi-falsity (1052^{a}1–2: 'truth is to think these; and there is no falsity nor is there any mistake'). There seems no motivation to depart from the simple view of *Int.* 1, 16^{a}12–16, that such sub-sentential terms are neither true nor false.

Suppose, however, that we focus on a special type of predicate. At *Int.* 5, 17^{a}11–12, Aristotle says that *even* a definition (for example, two-footed land animal) does not make a truth-bearing statement. The emphasis suggests that the case of a *definition* is the strongest candidate for a sub-sentential term being a truth-bearer—although, according to *Int.* 5, even that candidate fails. Why should 'two-footed land animal' seem a better—albeit unsuccessful—candidate for being a truth-bearer than 'pale'?

Consider the central place of combination and division in the Standard Account of truth and falsity ($1051^{b}2–3$). The problem with applying the Standard Account in the case of a humdrum predicate like 'pale' is that we lack some other item for its worldy correlate (pallor) to be combined with or divided from. It is precisely this lack which is remedied by the move from predicates ('pale') to affirmations ('Candy is pale', 'horses are pale'). Something with the complexity of an affirmation provides for the combination or division of Candy and pallor, or of horses and pallor.

But now consider a definitional predicate such as 'two-footed land animal', rather than a humdrum predicate such as 'pale'. The argument of the preceding paragraph may seem less persuasive. A definitional predicate is correlated with a worldly essence. What a definition expresses is not that an essence is combined with or divided from something else—rather, it expresses *what that essence is*. It would be strange to think of a worldy essence *two-footed land animal* being combined with—never mind being divided from—a worldly item *human being*: the essence *two-footed land animal* is precisely what the worldly item *human being* is. And, if the combination (never mind the division) of the worldly essence is not at issue, then it might seem that in this case at least there is nothing to be gained by moving to a linguistic item with the complexity of an affirmation.

Of course, Aristotle is not persuaded by this move—'*even* the definition of man is not a statement-making sentence' (*Int.* 5, $17^{a}11$). But it may be that we can adapt what he acknowledges as special about the case in order to understand why in *Met.* Θ10, $1051^{b}17–25$, he might want to treat a definitional *predicate* as quasi-true. Further, this focus on the special case of a *definitional* predicate, rather than predicates in general, fits well with the fact that Aristotle mentions a very limited range of worldly incomposites at $1051^{b}25–33$: namely, essences and non-composite substances (compare *An.* 3.6, $430^{b}28$; *Met.* *E*4, $1027^{b}27–8$)—if there were a general point about all predicates in view, we would expect mention of a wider set of worldly properties.

A definition is *of* some definiendum. If a definition is stated as a predicate (for example, two-footed land animal), then the target definiendum may have to be picked up from the context. If

Candy simply hears Merle say 'two-footed land animal', then she might not be able to tell whether he has spoken rightly (the discussion was on the definition of human being) or wrongly (the question was 'what is a kangaroo?'). Aristotle is not denying the plain fact that people can get it right or get it wrong when they offer a definition. His claim is rather that there is good reason to view the definitional predicate which someone provides when she gets it right as quasi-true; while there is good reason not to view what she does when she gets it wrong in terms of quasi-falsity.

Suppose the predicate stated is the right one for the definiendum indicated by the context. In that case we have a definitional predicate which picks out what is in fact the essence of the target definiendum. If the right essence has been identified, then we have definitional success—there is nothing else to achieve as regards the correlation between that predicate and that essence. Then there is reason to think of that predicate as right—as quasi-true—in that it makes contact with and states the relevant essence ($1051^{b}24$).

If a definitional predicate can be quasi-true, why does Aristotle refuse to admit a notion of quasi-falsity? There is certainly getting it wrong—*ignorance*—about essences ($1051^{b}25$, $1052^{a}2$–4). Aristotle emphasizes that such ignorance does not count as being mistaken (that is, as quasi-falsity: $1051^{b}25$–6, 27–8, 31–2, $1052^{a}1$–2). But why insist that such ignorance does not amount to quasi-falsity?

Ignorance—getting it wrong—is failing to provide the right definitional predicate for the definiendum indicated by the context. Suppose the context is a discussion of what human beings are, and that Candy is ignorant. Since she is ignorant, she does not offer the predicate 'two-footed land animal'. If she had done so, she would not have been ignorant; she would have got things right, and the predicate would have been quasi-true in that it picked out the relevant essence. But describing what she fails to do tells us very little about what she *does* do. There are plenty of things in the world which are unable to pick out essences with definitional predicates, but which are not ignorant in the way that Candy is: trees, dogs, and—maybe—newborn babies do not have the cognitive abilities

even to try to provide definitions (this is the point behind Aristotle's mention of blindness at 1052^{a}2–4). Candy's ignorance shows up in the fact that she is trying to define and failing. But that failure could be manifest in a huge variety of ways. Maybe she states a predicate which picks out an essence other than the one implicitly required by the context ('eight-tentacled sea-dweller'); or a predicate which does not pick out an essence at all ('green thing weighing more than 50 lb'); or states something which is not a predicate ('Socrates'); or something metaphysically muddled ('deciduous land animal') or grammatically muddled ('one-feeted land animals'). Aristotle has good reason not to lump all these different ways of failing together as instances of quasi-falsity. For a significant feature of falsity, as defined by the Standard Account, is that it does not amount to the same as not-being-true. There are plenty of items which are not true, but which are not false either: for example, questions and names. But all that is common to the different manifestations of Candy's ignorance is that they are not quasi-true: they do not pick out the right essence for the definiendum indicated by context.

Nor is there reason to privilege any of those displays of ignorance over the others, and count just *some* as quasi-false. 'Eight-tentacled sea-dweller' does indeed pick out an essence—the octopoid essence. But so too does 'green thing weighing more than 50 lb' pick out the property of being a green thing weighing more than 50 lb, and 'Socrates' pick out Socrates. In a context in which what is wanted is the human essence, none of these is any more successful than the others in picking it out. If quasi-truth for a definitional predicate is making contact with the contextually required essence, then ignorance is failing to make contact (1051^{b}25); but falsity is more than failing to be true; so Aristotle should not count ignorance about essences as mistake or quasi-falsity (1052^{a}1–2: 'there is no falsity, nor is there any mistake, but only ignorance').

Aristotle immediately qualifies this view at 1051^{b}26, however, and implies that it is possible to be mistaken in respect of an essence *accidentally*. One sense of the accidental, according to *Met.* *Δ*30, 1025^{a}14–30, is what is in fact the case, but neither necessarily nor usually (see also *Met.* *E*2, 1026^{b}31–3: what is so neither

always nor usually; and compare *Top.* 1.5, $102^{b}4$–26). Consider a predicate which does in fact pick out the essence required in a particular context, but which does not necessarily, always, or usually do so. Merle is giving a lecture on human nature: 'what Merle is lecturing about' in fact picks out the human essence, but only accidentally. Given what Aristotle has said so far, what verdict should we pass if Candy offers 'what Merle is lecturing about' as a definition of man? On the one hand, it will not do to say that Candy displays ignorance (gets it wrong): ignorance is failing to make contact ($1051^{b}25$) and this predicate *does* make contact (that is, it picks out the essence of man). But, on the other hand, there is a strong intuition that Candy has not got it right: no one would congratulate her on a quasi-true answer. Aristotle's remark at $1051^{b}26$ tells us precisely what to say: Candy is accidentally mistaken. *Accidentally* accommodates the point that the predicate does in fact, albeit accidentally, pick out the required essence, and so acknowledges that this is not simply a failure to make contact. At the same time *mistaken* picks up the intuition that the predicate is the wrong one. I am accidentally mistaken about an essence when I state a predicate which makes contact only accidentally. (An alternative interpretation would appeal to the discussions of what is known accidentally at *An. Post.* 2.8, $93^{a}21$–4; 2.10, $93^{b}30$–5.)

[B] The second alternative concerning linguistic incomposites is that they are items which do have propositional structure, but not of the type required by the Standard Account of truth and falsity. The suggestion again is that Aristotle has definitions in mind, but expressed in sentential form: for example, 'man is a two-footed land animal'. (What follows is a loose version of an interpretation due to Sorabji 1982, 1983: ch. 10.)

When considering alternative [A], the difficulty was to see why someone would want a notion of quasi-*truth* to apply to definitional predicates. Here the problem is the reverse. Treating sentences like 'man is a two-footed land animal' as true, and 'man is an eight-tentacled sea-dweller' as false, seems unproblematic. Why go for a notion of *quasi*-truth, as making contact and stating ($1051^{b}24$), and reject a notion of quasi-falsity altogether ($1051^{b}25$), rather

than applying the Standard Account straightforwardly to both sentences?

The Standard Account concerns the correspondence between worldly items combined and separated, and statements affirming or denying something of something (1051^{b}2–5; also *Int.* 1, 16^{a}9–16; *Int.* 6, 17^{a}25–6; *Met. E*4, 1027^{b}17–23). That account will not apply straightforwardly to definitions. An Aristotelian (real) definition says *what something is* (*An. Post.* 2.3, 90^{b}3–4; 2.10, 93^{b}29, 94^{a}11–14). It indicates the essence of what is defined (*Top.* 1.4, 101^{b}21–2; 1.5, 101^{b}38–102^{a}2; 7.3, 153^{a}15–16; 7.4, 154^{a}31–2). Definitions are not about the combination or division of worldly items, but about their identity—they are identity statements. This is clear in the early work *Topics*. If 'man is a two-footed land animal' is the correct definition, then two-footed land animal is the same as man (*Top.* 6.3, 140^{b}33–4). What is given by a definitional account is the same as the object defined (*Top.* 6.7, 146^{a}6–7). Aristotle argues in the *Topics* that there cannot be more than one definition of the same object, since different definitions would indicate different essences, and so the one object defined would have to be the same as different essences, which is impossible (*Top.* 6.4, 141^{a}35–141^{b}1; compare *Top.* 6.5, 142^{b}34–5; 6.13, 151^{a}33–4, 151^{b}16–17). Aristotle's later views on definition are much more difficult (see, for example, *Met. Z*6 and *Z*10–12). There are complicated investigations into which types of item properly have definitions (sensible substances, or their forms?); and whether definitions should include a reference to matter or not; and how reference to genus and differentia in a definition is consistent with a definition being a unity. But some core points remain. Rather than combining or dividing worldly items, a definition says what the worldly item which is its definiendum *is*. So, for example, pressure towards thinking that a definition should involve reference only to form is paralleled by pressure to think that it is forms rather than form–matter complexes which are defined. Then, since 'man is a two-legged land animal' says what the worldly item *man* is, we might well feel uncomfortable supposing that it is true in virtue of the worldly item *man* being combined with anything at all, much less divided from anything. And in that case the Standard Account, framed in terms of combination and division, will not apply. But there remains a strong intuition that

we can get definitions right. So Aristotle has good reason to look for a notion of quasi-truth which will apply to sentences giving definitions.

Does the particular claim that quasi-truth is making contact and stating (1051^b24) remain plausible? It is one thing to say that a correct definitional predicate makes contact with (that is, picks out) an essence, but less appealing to suppose that sentences pick out worldly items. However, the claim follows naturally given two points: *first*, that the Standard Account of truth does not apply, and, *second*, that a definition is about a worldly item. For, since it is not in virtue of the worldly item being combined with or divided from other items that the definition is true, the only way for that item to contribute to the truth of the definition will be for the definition somehow to relate directly to the essence defined. In that case, 'making contact and stating' should be taken as placeholder terms for that direct relation, whatever it is.

Finally, all that one could say about a definition which is wrong, such as 'man is an eight-tentacled sea-dweller', is that it fails to stand in that direct relation to the appropriate essence. And in that case Aristotle again has reason to say that this should not count as quasi-*falsity* (1051^b25, $1052^a1–2$). For, as already noted, falsity as characterized by the Standard Account is not the same as simply failing to be true.

6. $1051^b25–33$: The Worldly Side of the Truth Relation for Incomposites

Quasi-truth involves a relation between linguistic incomposites and some worldly incomposites. At $1051^b25–33$ Aristotle says something about the items on the worldly side of the relation. It seems that two cases are marked out:

(*a*) essences, 'the what it is' ($1051^b25–6$);
(*b*) substances which are not composite ($1051^b27–30$).

Aristotle makes much the same point about (*a*) and (*b*): that in neither case is it possible to be mistaken. It is not clear how significant it is that the qualification 'except accidentally' is explicitly attached to (*a*) but not to (*b*). Aristotle may be distinguishing between the cases, and saying that, whereas it is possible to be accidentally mistaken as regards (*a*), it is not so in the case of (*b*); or he may mean the qualification to be understood as obvious in the

case of (*b*) as well as (*a*). Aristotle's remark at 1051^{b}31–2 appears to refer back to (*a*) and (*b*), and summarizes the point that it is not possible to be mistaken in these cases: 'just what it is to be something' corresponds to (*a*), 'and actualities' to (*b*) (for use of the phrase 'just what it is to be something' to refer to essences, see *Top.* 4.1, 120^{b}21–6; *Met.* *Γ*4, 1007^{a}32–3; *Z*4, 1030^{a}2–4).

What are the non-composite substances? The claim that they are actual and not potential (1051^{b}28), with the supporting argument that they neither come into being nor perish (1051^{b}28–30), provides a clue. According to *Met.* *Z*8, 1033^{a}24–1033^{b}19, forms are neither made nor produced (see also *Met.* *Z*15, 1039^{b}20–7, and *H*3, 1043^{b}14–23, which refer back to *Z*8: either forms are eternal, or, if they exist at one time and not at another, they do not undergo any process of coming into being—see Burnyeat (1979: 141) for alternative interpretations of what it would be for forms to exist intermittently). So an appealing view is that the non-composite substances (*b*) are immaterial forms.

The phrase 'and similarly too' at 1051^{b}26–7 leaves the relation between (*a*) and (*b*) open. There are two options. The first is that (*a*) is the wider set of defined essences, including those which involve material elements (agreed examples will be hard to come by: perhaps human beings, defined with reference to flesh and bone); (*b*) will then focus on a narrower set of purely formal essences which involve no reference to matter (perhaps circles). The second option is that (*a*) and (*b*) coincide. According to this option, no definitions would involve reference to matter, and all defined essences would be purely formal; mention of (*b*) would then make explicit the point that (*a*) essences, which are the worldly correlate to definitions, are purely formal and actual. A decision between these options will rest in large part on broader issues concerning Aristotle's views about definition, and whether definitions do or do not involve reference to matter. These are difficult issues which take us well beyond the present chapter (for some discussion, see Frede 1990).

However, there is a question which arises whichever alternative is preferred: namely, what is the point of introducing case (*b*)? Suppose, on the one hand, that (*b*) marks out a subset of the defined essences (*a*). Then, in claiming (*a*) that it is not possible to be mistaken about any essences, Aristotle has already established the point that it is not possible to be mistaken about purely formal essences. Why draw attention to one special instance by emphasizing

the limited case of (*b*) purely formal essences? On the other hand, if (*a*) and (*b*) are coincident, why restate the claim (*a*) about defined essences in the 'non-composite/actuality' vocabulary of (*b*)?

One possible answer appeals to the fact that, apart from the introductory lines $1051^{a}34–1051^{b}2$, it is only in connection with case (*b*) that the terminology of actual and potential appears in *Θ*10 ($1051^{b}28$, 31). Maybe Aristotle mentions (*b*) purely formal essences in order to bring this terminology more to the fore, and so integrate *Θ*10's discussion of truth and falsity more closely with the rest of *Θ*. Aquinas offers an interpretation along these lines (*Comm. in Met.* §§1910–1913). According to Aquinas, Aristotle wishes to show that truth aligns with actuality rather than potentiality (that is, to bring the true–false dichotomy under the actual–potential schema); he has already shown that, in the case of composites, truth involves combination and division, which designate actuality; and now he shows that incomposites, about which there are only truths and no falsity, are purely actual. But it is hard to see why truth should be any more closely connected with actuality than is falsity. For, while a sentence is indeed true in virtue of the *actual* combination or division of appropriate worldly items, it is equally the case that a sentence is false is virtue of the *actual* (rather than the merely *potential*) state of the world.

Another possibility is that Aristotle mentions case (*b*) in order to flag the contribution of this discussion to a broader metaphysical project. Compare the direction taken by the argument of *Θ*8. Towards the end of that chapter Aristotle introduced the eternal–perishable relation as an instance of the actual–potential schema (*Θ*8, $1050^{b}6–1051^{a}2$; see Commentary, Chapter 8, §§11–14). In part that was because the idea of actualities detached from any correlative potentiality is important for the sort of project pursued in the second half of *Met. Λ* (recall Introduction, §7; and see also Commentary, Chapter 9, §9, on the second half of *Θ*9, $1051^{a}21–33$). The attention paid in *Θ*10 to case (*b*), purely formal essences, could be viewed in the same light. In the course of his discussion of truth and falsity, Aristotle is flagging issues which would be important in any such line of argument as that found in *Met. Λ*. Aristotle introduces in *Λ* an Unmoved Mover as the metaphysically primary entity in the universe (*Λ*7, $1072^{a}24–6$). Any such view requires an account of how there can be a single entity which gives rise to change in the universe (it is a *mover*) without itself undergoing any

change (it is *unmoved*). The account provided in *Λ* turns on the relations between desire and the object of desire, and thought and the object of thought, the crucial point being that objects of desire and of thought move without being moved (*Λ*7, 1072^{a}26–1072^{b}1). Whatever the details of an account like that, it makes the relation of thought to its objects of the first importance. The attention to (*b*) purely formal essences at *Θ*10, 1051^{b}26–30, signals some features of that relation which are of particular significance for an account of that type.

If the metaphysically primary object in the universe is to be an active thinker, then its thinking activity had better be the most valuable and dignified of activities. What about the object of that thinking? Aristotle considers issues raised by that question in *Met. Λ*9, and appeals to the view that thinking and its object are identical in cases where the object does not involve matter (1074^{b}36–1075^{a}5, with a reference to essences at 1075^{a}2; see also *An.* 3.4, 430^{a}3–5). It is just such objects of thought which are flagged by (*b*) in *Θ*10. Thought cannot be mistaken as regards such objects (*Θ*10, 105^{b}127–8, 31–2), and it would of course be absurd if the Unmoved Mover's thinking could be mistaken. Purely formal essences will be a particularly significant type of object of thought, if Aristotle is to avoid a disastrous dichotomy between the Unmoved Mover's thinking and what the thinking is about (see also *Λ*7, 1072^{b}19–21, where the notion of thought *making contact with* its object underpins an explanation of the identity of thought and its object: the term is the same as used at *Θ*10, 1051^{b}24–5). Finally, *Λ*9 closes with a problem about whether the Unmoved Mover's thought could have a composite object (1075^{a}5–10), and the composite/non-composite terminology is central to the *Θ*10 discussion.

Lines 1051^{b}32–3 advert to a problem about enquiry into essences. If we cannot be mistaken about essences, and a definitional statement of something's essence can only be true and cannot be false, then it is not clear what an investigation into something's essence would be. But we do somehow investigate and gain knowledge of essences. On this issue, see further *Met. E*1 (especially 1025^{b}7–16; and, for discussion, Kirwan 1971 and Berti 1978).

7. 1051^{b}33–1052^{a}4: Being and Not-Being in the Case of Incomposites

It is not easy to see what this passage is about, nor how it relates to the preceding 1051^{b}17–33. I take it as picking up the second

of the two points made at 1051^{b}22–3: that being is not the same in the case of incomposites as in the more straightforward case of composites. But Aristotle's text is particularly compressed, and my translation more expansive than usual.

The subject matter is announced at 1051^{b}33–4. According to a more literal translation, the passage would concern being-considered-as-truth and not-being-considered-as-falsity. However, if that were Aristotle's topic, then 1051^{b}33–1052^{a}4 would cover just the same ground as the preceding 1051^{b}23–33, the subject matter of which is stated at 1051^{b}23 as 'truth or falsity'. The present passage opens with a contrastive 'while', which suggests a new subject matter. The distinction at 1051^{b}22–3 between questions about truth and questions about being is the most appealing reference for the contrast. In that case, 1051^{b}33–1052^{a}4 will be about what it is for incomposites to be or not to be (just as 1051^{b}11–13 was about what it is for composites to be or not to be).

I understand Aristotle to be distinguishing two types of case at 1051^{b}34 and 1051^{b}35. However, the Greek construction by which he marks these cases ('there is one . . . there is one . . .') is unusual, and some other commentators translate differently and take Aristotle to be making a point about unity. A sufficient explanation for Aristotle's use of this unusual construction to mark a distinction between cases is that the text from 1051^{b}17 onwards already contains a host of nested contrasts marked in the more usual way, and the construction here is an attempt to avoid further confusing complexity (see Burnyeat 1984: 160–1 for further discussion).

The first case (1051^{b}34: 'if it is combined . . .') refers back to the account of being and not being in the case of composites at 1051^{b}11–13. According to that account, for Candy to *be* pale is for Candy and pallor *to be combined*, and for Candy *not to be* pale is for Candy and pallor *not to be combined*. At 1051^{b}34–5 Aristotle uses just nine Greek words to summarize the account. He has in mind just the case of an affirmation: for example, 'Candy is pale'. If that affirmation is true, then Candy *is* pale, and her *being* pale consists in the *combination* of certain items (Candy, pallor); if it is false, then Candy *is not* pale, and her *not being* pale consists in the relevant items *not being combined*. Aristotle makes it plain at *Met. E*4, 1027^{b}20–4—though at much greater length—that a *denial* ('Candy is not pale') would be rendered true by Candy and pallor not being combined.

In contrast, the second case (1051^{b}35: 'if in fact it is . . .') is that of the incomposites. I take this opaque sentence as follows. Aristotle has already explained a notion of quasi-truth which applies to linguistic incomposites: a definition is quasi-true if it 'makes contact with'—that is, picks out—the appropriate essence (1051^{b}24). So, instead of items in the world being combined or divided, the (quasi)-truth-maker is simply that there *is* an essence which is of a certain character. For example, corresponding to the correct definition of man there is an essence which is being-a-two-footed-land-animal (1051^{b}35: 'if in fact it is, then it is thus and so'). The important point is that there is no difference between the essence existing (and rendering a definition which picks it out quasi-true), and the essence being of a certain character. This is where the contrast with the first case lies (1051^{b}34–5: 'if it is combined . . .'). There *is* a difference between Candy existing and Candy being a certain way (for example, pale): Candy's not being pale consists in Candy and pallor being divided, which would render 'Candy is pale' false. The same point holds of the necessary truths mentioned at 1051^{b}9–10 ('some things are always combined . . .'). In that case too there is a difference between being-the-diagonal-of-a-square and being-incommensurable-with-the-side—although those two items are never divided, so that 'the diagonal is incommensurable' is necessarily true. But in the case of a defined essence, on the other hand, there are not *two* items at all. If being-a-two-footed-land-animal is in fact what the essence of man is, then the only alternatives are that there is such an item as that essence or that there is not: the only alternative to an essence being other than it is would be that there just is no such essence (1052^{a}1: 'if it is not thus and so, then it is not').

Aristotle makes it clear, at 1052^{a}1–4, that this account of being and not-being in the case of incomposites dovetails with the account of quasi-truth and quasi-falsity for linguistic incomposites which was provided earlier (1051^{b}17–33). The worldly alternatives are that there either is or is not an essence of a certain character. A definition can be quasi-true, since it may make the right sort of contact with the essence (1052^{a}1: someone who states the correct definition 'thinks' the essence). But there is no room for a notion of quasi-falsity (1052^{a}1–2: 'there is no falsity, nor is there any mistake'). Someone can get a definition wrong, and be ignorant of the essence of what she seeks to define (1052^{a}2–4). But such

ignorance—failing to make contact with an essence—does not count as quasi-*falsity* (recall §5 above).

8. 1052ª4–11: Different Types of Mistake

I take it that Aristotle here returns to a case mentioned earlier: statements whose truth values never change (1051ᵇ15–17), and whose worldly truth-makers are unchangeable (1052ª4). But this interpretation is not mandatory. In particular, one could take 1052ª4, 'the unchangeable things', to refer to the essences and incomposite substances which were the subject matter of 1051ᵇ17–32 (maybe picking up the argument against coming into being and perishing at 1051ᵇ28–30). However, the use of geometrical and arithmetical examples in the present passage (1052ª6–7, 8–10) suggests a connection with the necessary truths considered in the earlier part of the chapter (the geometrical notions mentioned at 1051ᵇ20–1 point back to 1051ᵇ15–17).

The passage still raises a host of difficult interpretative questions, in part because Aristotle expresses himself in a very compressed fashion, particularly in the remarks about prime numbers at 1052ª8–11. In what follows I offer my preferred view of Aristotle's point in this passage. This will involve deciding contentious issues without further comment (for example, taking it that the geometrical illustration at 1052ª5–7 concerns a statement about triangles in general, rather than about a particular triangle).

I start from the fact that Aristotle does *not* say that there are no mistakes about unchangeable geometrical facts. What he says (1052ª4–5) is rather that there are no mistakes in respect of time (1052ª5). It is the notion of a mistake in a certain respect that is the crux of this passage. Two points follow. First, the passage is about being mistaken, and therefore about statements being false: it is not about what can coherently be thought or what statements can coherently be made. Second, we can best understand the idea of mistakes in respect of time by contrasting them with mistakes in other respects. We will then see that Aristotle's overall point in this passage is that, whereas there are no mistakes in respect of time about, say, unchangeable mathematical facts, there can be mistakes in other specific respects.

Consider first a state of the world which is different at different times: for example, Mary being married (Mary and being-married

are sometimes combined, sometimes divided). Someone could be mistaken and make false statements about Mary's being married; and some such statements could be diagnosed as false in particular respects. For example, suppose that Mary was married, but is not married any longer, and Candy says that Mary is now married: then Candy has made a mistake *in respect of time*. Or suppose that Mary is married to Bartholomew, and Candy says that Mary is married to Cedric: then Candy has made a mistake *in respect of relation*.

Consider next a state of the world which never changes: for example, triangles containing angles equal to two right angles. Someone could certainly make mistakes about that: a poor geometer may say falsely that triangles contain angles equal to three right angles. Aristotle's claim is that they cannot, however, be mistaken *in respect of time*. There are two ways in which this claim, about mistakes in respect of time, can be extracted from Aristotle's geometrical example at $1052^{a}6–7$. These alternatives diverge on how significant it is that the person making a geometrical statement *realizes* that geometrical facts are unchangeable.

(i) If that realization is significant, then Aristotle is making a more limited claim. Suppose Candy realizes that geometrical facts are unchangeable, but that she nevertheless makes the false geometrical statement 'triangles contain angles equal to three right angles'. It cannot be appropriate to diagnose *her* mistake as one in respect of time. Aristotle intends to make a claim *only* about this sort of enquirer (hence $1052^{a}6–7$: 'if one thinks that the triangle does not change, one will not think that . . .'; and the translation at $1052^{a}5$ could be expanded instead as 'if someone supposes [that they are] unchangeable').

This claim is more limited because it leaves room for the possibility of extremely muddled people whose geometrical mistakes would be diagnosed as mistakes in respect of time. Suppose that Merle has *not* realized that geometrical facts are unchangeable, and makes the false statement 'triangles contain angles equal to two right angles at present'. It would be appropriate to diagnose Merle's mistake as one in respect of time: he has got the number of right angles correct, but has gone wrong as regards *when* triangles contain angles equal to two right angles. Aristotle's claim would not extend to this type of extremely muddled enquirer.

(ii) On the other hand, it may not be significant that an enquirer realizes that geometrical facts are unchangeable, and in that case Aristotle will be making a more general claim: that whatever degree of muddle lies behind a false geometrical statement, it is never appropriate to diagnose the mistake as being in respect of time. The point would be as follows. Statements are true or false in virtue of the appropriate things being as they are (1051^{b}6–9). The truth-makers for geometrical statements are unchangeable. So whatever false geometrical statement someone makes is always false, since the facts which render it false at any one time are unchangeable facts. Candy, who realizes that geometrical facts are unchangeable, says 'triangles contain angles equal to three right angles'. Merle, who does not realize that geometrical facts are unchangeable, says 'triangles contains angles equal to two right angles at present.' Candy's mistake is not a mistake in respect of time. And, if Merle's statement is indeed false (rather than, say, misleading), then his mistake is not in respect of time either. *No* geometrical mistake could be in respect of time, since geometrical truth-makers are unchangeable.

I prefer this more general claim, and I have opted for the appropriate supplemented translation at 1052^{a}5: 'if one supposes [that there are] unchangeable things.' The comment is aimed at those who would dismiss the whole of Aristotle's discussion at 1052^{a}4–11 on the grounds that there are no unchangeables. However, the geometrical example at 1052^{a}6–7 fits less easily with this alternative.

The overall point Aristotle wants to make in 1052^{a}4–11 emerges at 1052^{a}8. Let it be granted that it is not appropriate to diagnose a false statement concerning something unchangeable (for example, geometry or arithmetic) as embodying a mistake in respect of time—whether this be understood as (i) the more limited claim that the diagnosis is not appropriate in *some* such cases, or as (ii) the entirely general claim that the diagnosis is *never* appropriate in such cases. Aristotle's claim is that it could nevertheless be appropriate to diagnose a false geometrical or arithmetical statement as embodying a mistake *in some other particular respect*. I take this to be the point behind the example concerning prime numbers at 1052^{a}8–9. A poor mathematician could make a mistake about whether there are even numbers which are prime. The truth is that some even numbers

are prime—namely, the number 2—and some are not—namely, all the rest (1052^{a}9). Suppose Candy says falsely that no even numbers are prime (1052^{a}8–9). Candy's mistake cannot be in respect of time. But another more specific diagnosis would be appropriate. She has made a mistake *in respect of quantity*. She is right about something—namely, that there are even numbers which are not prime. But she is wrong about which and how many they are: she thinks that *none* of the even numbers is prime, whereas she should have said that *some* are prime (the number 2).

This is the point behind the telegraphic remark at 1052^{a}8–9. An arithmetical statement cannot be true at some times and false at others, because an arithmetical truth-maker cannot obtain at some times but not at others. But there are arithmetical properties which do hold of some numbers, not of others, as there are also arithmetical properties which hold of all numbers, and arithmetical properties which hold of no numbers. Then, given all that, there can be arithmetical mistakes in respect of *which* numbers a property holds of. 'No even numbers are prime' is a false arithmetical statement which embodies just such a mistake: it is not that *none* is prime, but that *some are* and *some are not* (1052^{a}8–9).

Finally (1052^{a}9–11) Aristotle draws a consequence. This type of arithmetical mistake is possible because there are properties which hold variously of some, of all, and of no numbers. It follows that a statement about an individual number could not be false in this respect. Suppose that Candy says falsely that the number 8 is prime. Since she has made a claim only about a single number, then it is not that she is right about something, but mistaken about *which number*. A statement about a single number will not admit of falsity in respect of which number it holds of, in the same sort of way that no arithmetical and geometrical statements admit of falsity in respect of time (1052^{a}10–11).

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TEXTUAL NOTES

I have translated the text edited by W. D. Ross (Oxford: Clarendon Press, 1924). I note here divergences between Ross's text and that edited by W. Jaeger (Oxford Classical Text; Oxford: Clarendon Press, 1957), and indicate those places where I have departed from Ross.

Θ1, 1045^{b}33: Reading *τὸ τὶ* as Ross, rather than *τῷ τὶ* as Jaeger.

Θ3, 1047^{a}9: Reading *καὶ ἔτι ὅν τρόπον* as Jaeger, rather than *καὶ ἔτι ὄν* as Ross.

Θ3, 1047^{a}32: Reading the feminine dative at *μάλιστα ᾗ κίνησις* following a suggestion by Sedley, rather than the feminine nominative *μάλιστα ἡ κίνησις* as Ross and Jaeger.

Θ4, 1047^{b}3: Reading *ἤ ἀκολουθεῖ* as Ross, rather than *ᾗ ἀκολουθεῖ* as Jaeger. For more detailed discussion, see Ross (1924: ii. 247) and Burnyeat (1984: 100, 102, 104).

Θ4, 1047^{b}17–18: All texts read *ἔστω δὴ τὸ* A *δυνατόν*, and I have translated acordingly. However, in partial agreement with a suggestion at Burnyeat (1984: 109–10), I interpret the argument as if the text read *ἔστω δὴ ἀδύνατον*. For further detail, see Commentary, Chapter 4, §4.

Θ4, 1047^{b}21: Omitting an occurrence of *ἀνάγκη* in the antecedent of this conditional, in agreement with both Ross and Jaeger, who follow Bonitz's suggestion here. The additional *ἀνάγκη* would be redundant, making the conditional read: 'then if it is necessary that B is impossible, it is necessary that A is too.'

Θ5, 1048^{a}16: Omitting an occurrence of *ποιεῖν* with both Ross and Jaeger.

Θ6, 1048^{a}37: Reading *τὸ* as Ross, rather than *τῷ* as Jaeger.

Θ6, 1048^{b}4–6: Reading *ταύτης δὲ τῆς διαφορᾶς θατέρῳ μορίῳ ἔστω ἡ ἐνέργεια ἀφωρισμένη θατέρῳ δὲ τὸ δυνατόν* as Ross, rather than

ταύτης δὲ τῆς διαφορᾶς θάτερον μόριον ἔστω ἡ ἐνέργεια <ἡ> ἀφωρισμένη, θάτερον δὲ *τὸ δυνατόν* as Jaeger.

Θ6, 1048^{b}10–11: Ross adds *ἢ* to read *λέγεται δυνάμει καὶ ἐνεργείᾳ<ἢ> πολλοῖς τῶν ὄντων*.

Θ6, 1048^{b}15: I have accepted an emendation to *γένεσει* suggested by Myles Burnyeat. Both Ross and Jaeger read *γνώσει*, but that does not make good sense. See further commentary, Chapter 6, §5.

Θ6, 1048^{b}19–20: Omitting *ἡ ἰσχνασία αὐτό* as Jaeger; Ross emends to *ἢ ἰσχνασία* and omits *αὐτό*. See Ross (1924: ii. 253) for discussion.

Θ6, 1048^{b}22–3: Adding *ἦ* and omitting *ἡ* with both Ross and Jaeger to read *ἀλλ' ἐκείνη <ἦ> ἐνυπάρχει τὸ τέλος καὶ [ἡ] πρᾶξις*.

Θ6, 1048^{b}33: Retaining *καὶ κινεῖ καὶ κεκίνηκεν* with Ross.

Θ6, 1048^{b}23–35: Double square brackets [[. . .]] in this particularly corrupt section indicate insertions, which are accepted by both Ross and Jaeger.

Θ7, 1049^{a}15: Translating as Ross, who adds *πεσεῖν*.

Θ8, 1049^{b}16–17: Translating as Ross, rather than as Jaeger who restores *τοῦ λόγου* to give *ὥστ' ἀνάγκη τὸν λόγον <τοῦ λόγου> προϋπάρχειν καὶ τὴν γνῶσιν τῆς γνώσεως*.

Θ8, 1050^{a}13–14: Translating as Ross, who reads *οὗτοι δὲ οὐχὶ θεωροῦσιν ἀλλ' ἢ ὧδι, ἢ ὅτι οὐδὲν δέονται θεωρεῖν*. But the text is difficult, and alternatives have been proposed (for example, omiting *ὅτι*; or reading *οὐχ ἦ* for *οὐχὶ*, and perhaps in addition reading *ὅ τι* or *ὅτε* for *ὅτι*). See Ross (1924: ii. 262–3) for fuller discussion.

Θ8, 1050^{a}24: Reading *οἷον ὄψεως ἡ ὅρασις* as Ross.

Θ8, 1050^{a}25: Reading *ἀπὸ τῆς ὄψεως* as Ross, rather than *ἀπὸ τῆς ὄψεως ἔργον* as Jaeger.

Θ9, 1051^{a}26–7: Translating according to Jaeger's reading and punctuation *ἰδόντι ἄν ἦν εὐθὺς δῆλον. διὰ τί ἐν ἡμικυκλίῳ ὀρθή καθόλου*; *διότι ἐὰν ἴσαι τρεῖς*. Ross has a second *διὰ τί* rather than *διότι*, and punctuates differently: *ἰδόντι ἀν ἦν εὐθὺς δῆλον διὰ τί. ἐν ἡμικυκλίῳ ὀρθὴ καθόλου διὰ τί*; *ἐὰν ἴσαι τρεῖς*.

Θ9, 1051^{a}30–1: Reading *αἴτιον δὲ ὅτι νόησις ἡ ἐνέργεια* as Jaeger, rather than *αἴτιον δὲ ὅτι ἡ νόησις ἐνέργεια* as Ross.

Θ10, 1051^{b}1: Translating *κυριώτατα ὄν*, which is marked for deletion by Ross but retained by Jaeger.

Θ10, 1051^{b}5–6: Reading *τὸ ἀληθὲς λεγόμενον ἢ ψεῦδος* as Ross, rather than *τὸ ὡς ἀληθὲς λεγόμενον ἢ ψεῦδος* as Jaeger.

Θ10, 1051^{b}10–13: Translating according to the text and punctuation of Ross, who gives *τὰ δ' ἐνδέχεται τἀναντία, τὸ μὲν εἶναί ἐστι τὸ συγκεῖσθαι καὶ ἓν εἶναι, τὸ δὲ μὴ εἶναι τὸ μὴ συγκεῖσθαι ἀλλὰ πλείω εἶναι*. Jaeger parenthesizes the lines, inserts *γὰρ* at 1051^{b}11 and closes with a full stop at 1051^{b}13: *τὰ δ' ἐνδέχεται τἀναντία* (*τὸ μὲν <γὰρ> εἶναί ἐστι τὸ συγκεῖσθαι καὶ ἓν εἶναι, τὸ δὲ μὴ εἶναι τὸ μὴ συγκεῖσθαι ἀλλὰ πλείω εἶναι*).
See Ross (1924: ii. 275) for discussion.

Θ10, 1051^{b}20: Translating the addition accepted by both Ross and Jaeger *ὥσπερ τὸ λευκὸν <τὸ> ξύλον*.

Θ10, 1051^{b}31: Reading *ἐνέργειαι* as Ross, rather than *ἐνεργείᾳ* as Jaeger.

Θ10, 1051^{b}33–4: Reading *τὸ δὲ εἶναι ὡς τὸ ἀληθές, καὶ τὸ μὴ εἶναι τὸ ὡς τὸ ψεῦδος* as Ross, rather than *τὸ δὲ εἶναι τὸ ὡς ἀληθές, καὶ τὸ μή εἶναι τὸ ὡς ψεῦδος* as Jaeger.

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