

# Anhang

## A. Aristotle's Theory of Dispositions. From the Principle of Movement to the Unmoved Mover

It could well be argued that no one influenced and shaped our thinking about dispositions and causal properties more than Aristotle. What he wrote about power (*dynamis*), nature (*physis*) and habit (*hexis*) has been read, systematised and criticised again and again during the history of philosophy. In what follows, I will sketch his thoughts about dispositions and argue that it can still be regarded as a good theory.<sup>1</sup>

### A1. *It's all Greek to me*

If asked to give an account of the thoughts of some ancient thinker about some modern concept, the first problem is: Which is the word I have to browse for in the index? The origin of the problems connected to contemporary theories of dispositions – be it of dispositional predicates or of dispositional properties – dates back to the heyday of logical empiricism. The problem of disposition arose from the quest for an intimate bond between experimental observations and the explanatory theoretical language. This is very much a project of the twentieth century and it is, thus, no trivial matter that an ancient thinker had any thoughts about this at all.

Now, it may give us some hope that the word “disposition” itself has a Latin origin in the word *dispositio* that in turn has a Greek equivalent, *diathesis*, but taken in this way “disposition” means something like “orderly arrangement”, be it of things, speeches or soldiers in an attacking army. Aristotle, of course, has a theory about the correct arrangements of the parts of a speech or drama. For this meaning of the word “disposition” we have to consult his writings on rhetoric and poetics, but this is not at all at stake when we are asked for Aristotle's theory of dispositions. In this question, “disposition” means rather something like “causal power”. Of course, there is ample material on causal power in the writings of Aristotle, but this material is connected

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<sup>1</sup> This appendix is an English précis of the book, together with some new material.

to words like *dynamis* (“capacity”), *physis* (“nature”) or *hexis* (“habit”). In fact, much of the theorising about causal powers routes back, one way or other, to Aristotle’s thoughts about *dynamis*, *physis* and *hexis*. In my discussion, I will start with presenting what Aristotle says about *dynamis* and will later contrast with his statements about *physis* and *hexis*.<sup>2</sup>

## A2. From Homer to Aristotle

When expounding his theory of causal powers, the key word for Aristotle is *dynamis*. In Aristotle’s time, this word was in common usage. It can already be found in Homer. Here are four quotes featuring this word:<sup>3</sup>

[Odysseus:] but bring ye healing, my friends, for with you is the *dynamis*. (*Odyssey* X 69; tr. Murray)

[Telemachos to Nestor:] O that the gods would clothe me with such *dynamis*, that I might take vengeance on the wooers for their grievous sin (*Odyssey* III 205 sq.)

[Alexandros to Hector:] we will follow with thee eagerly, nor, methinks, shall we be unwise wanting in valour, so far as we have *dynamis* (*Ilias* XIII 785 sqq.)

[Achilles to Apollo:] Verily I would avenge me on thee, had I but the *dynamis*. (*Ilias* XXII 20)

In Homer, the *dynamis* is something with or within a man that allows him to fulfil a certain task or defeat his enemy, and sometimes the *dynamis* is thought to be given by a god. Later, the word is to acquire a wide field of possible meanings. It can even mean the riches of a wealthy man (cf. Plato, *Rep.* 423a: *chrēmata te kai dynamis*) or the army of a kingdom (cf. *Mx.* 240d: *bē Persōn dynamis*, the army of the Persians), and even the phonetic quality of a letter (cf. *Cratyl.* 412c: *tēn tou kappa dynamin*) or the meaning of letters and syllables (cf. *Hip. mai.* 285d).<sup>4</sup>

<sup>2</sup> That Aristotle’s theory of *dynamis* is a theory of dispositional properties has also been seen (among others) by Liske 1996 and Wolf 1979, who (though under the name of “possibility”) discusses both Aristotle’s theory and modern theories of dispositions in her book.

<sup>3</sup> There are six more occurrences of the word in Homer: *Ilias* VIII 294, XIII 786 and *Odyssey* II 62, XX 237, XXI 202 and XXIII 128. Though the noun is quite rare, there are in all about 140 occurrences of words (including verbs and adjectives) containing the root *dyna-*. It would be worth checking our findings against this much broader basis.

<sup>4</sup> All occurrences of *dynamis* in Plato (and many in earlier authors) are collected and discussed in Souilhé 1919.

From the sixth century BC onwards, we find the word *dynamis* in philosophical and medical contexts.<sup>5</sup> For example, Alcmaeon of Croton (ca. 570-500) uses the term to define health (*hygieia*) as the balance of powerful things (*isonomia tôn dynamis*), which means the equal presence “of moist and of dry, of cold and of hot, of bitter and of sweet” (DK 24 B 4). Here it is not clear whether Alcmaeon uses *dynamis* to denote an abstract power or the powerful thing itself, i.e. whether dryness or the dry is the *dynamis*. In a quotation from Democritus (ca. 460-370), it is clear that the *dynamis* to be healthy is not some concrete thing, but some property that resides in the human body (DK 68 B 234) – which is the reason why people should rather care for their health by adjusting their diet than pray that health may be given to them by the gods. This ambiguity may be reflected in Anaximenes’ (ca. 580-520) remark that neither the hot nor the cold are substances, but properties of an underlying matter (DK 13 B 1 = KRS 143: *pathê koina tês hylês epigignomena tais metabolais*). For Anaximenes, powers “interpenetrate the elements or bodies” that are their bearers (DK 13 A 10 = KRS 145: *tas endiêkousas tois stoicheiois ê tois sômasi dynamis*).<sup>6</sup>

### A3. Active powers

Thus, when Aristotle started to think about dispositions, there was already ample material he could draw on. There was the usage in language at least since Homeric times and the word had already entered medical thinking and natural philosophy – and there were also the beginnings of thinking about *dynamis*, though the first coherent treatise on *dynamis* that we know of is the one by Aristotle, i.e. the ninth book of his *Metaphysics*.<sup>7</sup>

Considering the, by then, quite respectable history of the word, it does not come as a surprise that, in his well-known manner, Aristotle treats *dynamis* as a word with many different meanings, as a *polachôs legomenon*, as something that is spoken of in many ways. Though there are many meanings of the word

<sup>5</sup> For a survey of *dynamis* in the Hippocratic texts cf. Plamböck 1964.

<sup>6</sup> There is also a special use of *dynamis* and *dynaton* in geometry, which Aristotle explicitly mentions as a metaphorical use of the term (Met. V 12, 1019b 33-34; IX 1 1046a 6-9). Cf. section 2.2.6 for further references.

<sup>7</sup> Smets 1952 carves up Met. IX 1-9 into many different passages by different hands, distinguishing bits written by Aristotle (at different times during his life) from bits by his students or even later Aristotelians. Without doubt, the text has its history and developed over some time. However, I show that such a dissection of the text is not necessary and that, on the contrary, the whole text can be read as contributing to a single theory.

*dynamis*, Aristotle thinks that nearly all of these different meanings are related to one another and that they make up a sophistically knit web of meanings. In the centre of this web there is a meaning quite close to the Homeric use of the term: *dynamis* as an active power. For *dynamis* used in this way, Aristotle gives the following definition:

“*Dynamis* means a source (*archê*) of movement (*kinêsis*) or change (*metabolê*), which is in something else or in itself as something else.” (Met. V 12, 1019a15f)

The words featuring in this definition are all widely used Greek words, but in Aristotle’s language they function as technical terms that are in want of an explanation. Thus, I will, in turn, explain what Aristotle means by the terms “principle”, “change” and “movement”, and what he wants to express by the strange phrase “in something else or in itself as something else”.

To begin, a principle (an *archê*) is defined by Aristotle as “a first thing [...] from which movement and change take their inception” (Met. V 1, 1013a18). In this vein, he calls father and mother the principles of the child because the coming to be of a child takes its start with an interaction between father and mother. “Change and movement” (*kinesis* and *metabolê*) are probably mentioned as a pair in the definition in order to indicate that an active power can be related to any of the different kinds of changes that Aristotle distinguishes at other places (notably at Cat. 14, Phys. V 2 and VII 2). According to Aristotle, changes pair off in two main kinds. The first is substantial change, which can be a coming-to-be or a passing-away of a substance, which is an entity that exists on its own, like a man, a dog or a tree. Thus, birth is the beginning of a man’s existence and death the end of his existence; both are substantial changes. The other kind is the change of some accident, which can be further differentiated according to the category the changing accident belongs to. Aristotle acknowledges that there are three accidental categories with irreducible changes: quality, quantity and place. A change in quantity can either be growth or diminution.

#### A4. *Where is an active power?*

The strange phrase “in something else or in itself as something else” is still in want of explanation. I will follow Aristotle’s own strategy and explain its meaning through the discussion of two examples. The examples I will discuss are, in turn, architecture and medicine, i.e. the art of building and the art of healing.

Now, *where* is the art of building? It is not in the house to be built because this does not yet exist and non-existing things cannot be bearers of any properties, nor is it in the building material: logs and stones know no art. It is, of course, in the builder (Met. V 12, 1019a 16f). He has the active disposition to bring about a change “in something else”, i.e. in the building material, from being mere logs and stones to being a new house. Thus, the point of the first part of our strange phrase (“in something else”) is that an active power causes changes in something that is distinct from the thing that is the bearer of that power.

The other part of Aristotle's strange phrase can be illuminated by the second example, the art of healing. Where is the art of healing? It is, obviously, in the practitioner, for example in Hippocrates. But what happens if Hippocrates becomes ill himself? In many cases, Hippocrates will be able to heal himself. It is the same ability that allows healing the flu of other people and one's own – there is no necessity for Hippocrates to learn something new, but when he does, indeed, heal himself, Hippocrates is at the same time the bearer of the art of healing and the object undergoing the change of becoming healthy. This fact notwithstanding, Aristotle wants to classify the art of healing as an active power, for it is true that Hippocrates does not heal someone else, but, or so Aristotle would say, he heals himself “as another”. What he means by this becomes clear in Aristotle's explanation of the difference between accidental and non-accidental happenings:

[...] it may happen that someone becomes his own cause (*aitia*) of health, if he is a healer; but he has the art of healing not insofar as he is being healed, but it just happens (*symbebéken*), that the same person is a healer and is being healed. Therefore, [being a healer and being healed] are at times separated from each other. (Phys. II 1, 192b 23-27)

Hippocrates' ability to heal is independent from his being able to become healthy. His ability to heal is due to his study of medicine; his ability to become healthy is due to his being a human with a certain bodily constitution. There is no intimate connection between these two properties of Hippocrates – he can have the one without the other. Thus, it is only by accident that Hippocrates can heal himself. This is Aristotle's rationale for saying that a practitioner may be able to heal himself, but if he does so he heals himself *as another*, i.e. not as a practitioner, but as a human being with a certain bodily constitution. Thus, even in this case the art of healing is within the healed, but not as healed (Met. V 12, 1019a 18).

### A5. *Extending the conceptual network*

According to Aristotle, the word *dynamis* has many meanings. Most of them, or so Aristotle says, are systematically connected with one another, and active powers are the core of this conceptual network. Intimately connected with them are passive dispositions. To have a passive disposition allows the bearer of this disposition to undergo a change. Thus, a passive disposition is a principle of a change in the bearer of the disposition itself caused by something else or by itself as something else. For every active power to be realised there needs to be a matching passive disposition.

Next come qualified dispositions, which are principles to do something well or after a decision to do so, as opposed to do something somehow or by accident. Aristotle illustrates this by contrasting a drunkard's ability to walk with the ability to walk of a sober person. It should be clear that both can walk somehow, while only the sober person can walk well, i.e. without staggering and without pausing.

Moreover, Aristotle mentions resistance dispositions, which allow their bearers to resist changes and stay unchanged. If, e.g., a rod is flexible, it can resist breaking when being bent. Thus, a resistance disposition is a principle for not being changed by something else.

All of these different *dynamis* are ultimately related to an active power: Having a passive disposition means to have the disposition to be changed by something with a matching active power, having a resistance disposition means to have the disposition not to be changed by something with a matching active power and having a qualified disposition means to have any disposition in a qualified way where this disposition is itself an active power or, again, related to an active power. This is why Aristotle says that active power is the core concept of *dynamis*, its *kyrios horos* (Met. V 12, 1020a4).

Thus far, the different varieties of *dynamis* are tied together by a so called *pros hen* relation: they all share an (implicit) reference to one and the same core concept of active power. In extending the conceptual network of *dynamis*, Aristotle does not rest with this, but uses his second tool to extend conceptual networks: analogy. By this, he introduces a second family of *dynamis* or dispositions, which are no longer dispositions for change, but dispositions for being something:

Our meaning [...] is as that which is building is to that which is capable of building, and the waking to the sleeping, and that which is seeing to that which has its eyes shut but has sight, and that which has been shaped out of the matter to the matter, and that which has been wrought up to the un-wrought. [...] some [of

these] are as movement to *dynamis*, and the others as substance to some sort of matter. (Met. IX 6, 1048a35-b9; tr. Ross)

This second family is introduced by a set of examples and the reader is invited to recognise the similarity between these examples by considering analogous cases together (*tô analogon synboran*, 1048a 37). Those cases that are “as substances to some sort of matter” are said to stand in an analogy to those cases that are “as movement to *dynamis*”. Aristotle’s claim is that, in a way, a substance relates to its matter like a change relates to the respective *dynamis*. Here we see that Aristotle’s theory of dispositions becomes relevant for the very heart of his ontology, the hylomorphic composition out of substances from form and matter.

#### A6. *The syntactical structure of a dynamis ascription*

It is revealing to have a closer look at the Greek phrases that Aristotle uses to ascribe dispositions or *dynameis*.<sup>8</sup> He can, of course, simply say that something has a *dynamis* for something (*ecbei tēn dynamin tou ...*), but he can also use the verb *dynasthai* (choosing either a finite form of this verb like *dynatai* or the participle *dynameon*), or he can use the adjective *dynaton*, of which Aristotle explicitly says that something is *dynaton* to do something if it has the *dynamis* to do this (Met. IX 1, 1046a20-21). To express that someone has the disposition to walk (*badizein*) we can, thus, use either of the following Greek phrases: *ecbei tēn dynamin tou badizein* – *dynatai badizein* – *dynameos badizein estin* – *dynaton esti badizein*. In the context of Aristotle’s metaphysics, there is another phrase that is important here: *dynamei badizontos estin*. This phrase uses the dative case *dynamei* to express a certain respect (i.e. in its function as *dativus respectus*), saying that, with respect to his *dynamis*, someone is a walker, traditionally translated as “someone is a potential walker”.

The adjective *dynaton* can, however, also mean as much as “possible” and, hence, *dynaton estin* as much as “It is possible that” – and, thus, it is sometimes synonymously used with *endechestai*, which means “It may happen that”. Aristotle himself discusses this use of *dynaton* and he explicitly says that this use of *dynaton* is *ou kata dynamin* (1019b 34), that it is not based on dispositions. It belongs to the talk of possibility, not to the talk of dispositions.<sup>9</sup> To be sure,

<sup>8</sup> For textual references cf. section 1.5.1.

<sup>9</sup> Cf. sections 1.4.2 and 1.4.3 on the use of *dynaton* in the context of modal logic and van Rijen 1989 on Aristotle’s overall theory of possibility.

there are intimate connections between disposition talk and possibility talk. But there are important differences between them and, thus, they have to be kept apart.<sup>10</sup> I will argue that there is an intriguing syntactical difference that reveals the crucial ontological difference. Syntactically, “It is possible that ...” is a sentence operator. It combines with a sentence and forms a sentence again. The phrases that are used to ascribe dispositions, on the other hand, are predicate modifiers<sup>11</sup> both in ancient Greek and in modern languages. Phrases like “... has the disposition to ...” or “... is able to ...” combine with predicates and form new predicates. They combine with, say, actualisation predicates in order to yield disposition predicates.

#### A7. *The ontological structure of having a dynamis*

I now claim that this syntactical difference mirrors a crucial ontological difference. This will be obvious if we look at the usual possible worlds semantics for modal operators like “It is possible that ...”.<sup>12</sup> According to this approach, a sentence of the form “It is possible that  $p$ ” is true in the actual world if and only if there is a possible world  $w$  such that  $w$  is accessible from the actual world and the sentence  $p$  is true in this possible world  $w$ . The truth-maker of such a sentence is, thus, not anything in the actual world, but something in some possible world.

A *dynamis*, on the other hand, i.e. an ability or disposition, is something that is to be encountered in the actual world. It is I in the actual world who has or has not the ability to speak Chinese. Such an ability is a quality token of which I am the bearer. Thus, a disposition ascription of the form “ $x$  has the disposition to do (or to be)  $F$ ” is true if and only if there is a quality token  $d$  such that (1)  $x$  is the bearer of  $d$  and (2)  $d$  allows  $x$  to do (or to be)  $F$ .

An Aristotelian *dynamis* is, thus, something in the actual world and *dynamis* ascriptions are about the actual world. They ascribe actual properties to actual things. By no means do they constitute a “ghost world” of mere *possibilia*. We can sum up Aristotle’s stand on this question by formulating two principles, the Bearer Principle and the Principle of Actuality. The Bearer Principle says that, like all properties, dispositions always have a bearer. There cannot be a

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<sup>10</sup> I argued for this in Jansen 2000a. Buchheim/Kneepkens/Lorenz 2001 is a collection of essays that discuss the contrast between disposition talk and possibility talk from Aristotle through to Heidegger. Cf. also Jacobi 1997.

<sup>11</sup> Cf. Clark 1970. For more references cf. section 1.5.3.

<sup>12</sup> Cf. Weidemann 1984, Hughes/Cresswell 1996.



disposition without a bearer and a disposition exists if and only if there is a bearer having that disposition. The Principle of Actuality says that nothing has only potential properties or dispositions. If  $x$  has at  $t$  the disposition to be or to do  $F$ , then there is at least one  $G$  such that  $x$  is at  $t$  actually realising  $G$ .<sup>13</sup> The Principle of Actuality has a somewhat trivial instantiation because for Aristotle the dichotomy between actuality and potentiality (or between categorical and dispositional properties) does not make up distinct classes of things, but is meant to clear up ambiguities in language. One and the same property like mathematical knowledge is both a disposition and a realisation. It is the disposition to solve mathematical problems, but at the same time it is the realisation of the disposition to learn about mathematics (cf. An. II 5, 417a 22-b 2 with Phys. VIII 4, 255a 33-b 5). Thus, a disposition is itself the realisation of another disposition, and a potentiality something that is actual. Thus, we get a trivial instantiation for the Principle of Actuality if we choose “the disposition to be or to do  $F$ ” as an instantiation for  $G$ .

#### *A8. Hartmann and Hintikka: Two influential interpretations*

We are now prepared to review two recent interpretations of Aristotle's teachings about *dynamis*, which were probably the most influential in the twentieth century: those by Nicolai Hartmann and Jaakko Hintikka.

In his ontology of modality, Hartmann distinguishes two kinds of possibility: total possibility and mere partial possibility.<sup>14</sup> In Hartmann's eyes, it is total possibility that is the only serious candidate for a rigorous treatment in an ontology of modality: A state of affairs  $s$  is called totally possible if and only if all necessary conditions for  $s$  are given. It is a consequence of Hartmann's own determinism that the necessary conditions are jointly sufficient. For this reason, in Hartmann's theory there is a collapse of modalities. Contrary to intuition, there is no longer an extensional difference between the possibility and necessity: All and only totally possible states of affairs are necessary.

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<sup>13</sup> Cf. Kosman 1969, 43: “[...] for anything which is potentially A, there is some B which at the same time that thing is actually.” Menn 1994, 94 neglects the principle of actuality; although, he seems to be conscious about it (cf. 95 n. 32) and, thus, ascribes Aristotle a theory of *possibilia*, i.e. a theory about non-being, but possible things. Cf. also Stallmach 1959, 79, arguing against Hartmann 1938: “Auch bei Aristoteles kommt keine Möglichkeit vor ohne eine Wirklichkeit, die sie trägt, nur ist diese nicht – wie die Megariker wollen – schon die Wirklichkeit dessen, dessen Möglichkeit sie erst ist.”

<sup>14</sup> Cf. Hartmann 1938. On Hartmann's modal ontology cf. Hüntelmann 2000, on his interpretation of Aristotle cf. Seel 1982 and Liske 1995.

Hartmann accepts this consequence while it is a very much unwanted result in my eyes. But more important for his interpretation of Aristotle is Hartmann's concept of partial possibility: A state of affairs  $s$  is partially possible if and only if at least one necessary condition for  $s$  is given. Hartmann now accuses Aristotle that he has only dealt with the inferior concept of partial possibility and rejected the Megarian concept of *dynamis* (to be discussed in the next section), which Hartmann sees as a precursor to his own views.<sup>15</sup> However, of course, there are many different kinds of necessary conditions for  $s$ , even if we take only those necessary conditions into account, for which it is a contingent matter whether they obtain or not.<sup>16</sup> Thus, it is clear that Hartmann's interpretation is far too unspecific as an interpretation of *dynamis* – while having a *dynamis* for  $F$  certainly is a necessary condition to do  $F$ , we do not do justice to Aristotle's account of *dynamis* if we treat it on a par with the obtaining of just any necessary condition.

While Hartmann interprets Aristotle in terms of his concept of partial possibility, Jaakko Hintikka's interpretation draws on the so called principle of plenitude. In Hintikka's wording, the principle of plenitude says that “[n]o unqualified possibility remains unrealised through an infinity of time”.<sup>17</sup> The principle of plenitude is closely related to a temporal interpretation of the alethic modalities, i.e. of possibility and necessity. According to such a temporal interpretation, a proposition  $p$  is necessary if and only if it is always the case that  $p$ , and it is possible if and only if it is at least at one time the case that  $p$ . Now, it is normally not disputed that it is always the case that  $p$  if  $p$  is necessary and that whatever is the case at some point in time must be possible.<sup>18</sup> It is, however, not that clear that all possibilities will or even could be realised at some point of time. It is both possible that I sit at noon and that I

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<sup>15</sup> Cf. Hartmann 1937. Hartmann's interpretation of Aristotle is influenced by the – different – position of Zeller 1882.

<sup>16</sup> As any necessary proposition is implied by any statement, a necessary statement like “ $1 + 1 = 2$ ” may be seen as expressing a condition that is necessary for any other statement. If seen thus, there are no states of affairs that are not partially possible; even impossible states of affairs are partially possible when we take “necessary condition” in the logical sense and allow necessary propositions to be included within the set of conditions.

<sup>17</sup> Hintikka 1973, 96.

<sup>18</sup> Of course, these two observations correspond to the rules of medieval logic that (a) it is valid to conclude actuality from necessity (*ab necesse ad esse valet consequentia*) and (b) to conclude possibility from actuality (*ab esse ad posse valet consequentia*). It is, however, disputable, what the range of the rules formulated in the main text is, for there are necessary propositions like “ $1 + 1 = 2$ ” or “At twelve o'clock it is twelve o'clock” which may be said to be true at no point of time, but rather in some timeless manner.

stand at that time, but, of course, I can realise only one of these possibilities at noon. Even if we forgot the reference to a certain time, there remain problems: It is possible that, in the future, my son will marry and found a family, but it is also possible that he will remain a bachelor all his life. However, of course, both possibilities cannot be realised. To discard such obvious counter-examples to the principle of plenitude, Hintikka talks about “unqualified possibilities”. Unqualified possibilities are such possibilities that can, in principle, be realised at any point of a maybe eternal history, like the possibility that something red is round or that there exists an animal that is able to fly.

It has been a matter of debate whether Aristotle does or does not accept the principle of plenitude. While Lovejoy, in his great study on the principle of plenitude,<sup>19</sup> claimed that Plato accepted the principle, but Aristotle did not, Hintikka takes the opposite stand and attributes the principle to Aristotle, but not Plato. I will not argue for any of these alternatives here, but rather draw attention to two important observations:

(a) If Aristotle subscribed to the principle, it was nothing he took for granted, for in his *De Caelo* I 12 he presents a rather lengthy (and maybe fallacious) proof of this principle for the very special case of eternal entities. The claim he argues for in *De Caelo* is if it is possible for something to exist eternally, it will exist eternally, which in turn implies that all eternal beings are necessary beings. If the principle of plenitude would be some tacit background assumption of the semantics of *dynaton* or *dynamis*, he would not have needed such an elaborated argument for this claim. Thus, for Aristotle, the principle of plenitude cannot be a trivial element of the semantics of *dynaton*.

(b) Even if it were such an element, the “unqualified possibilities” that feature in the principle of plenitude are not the topic of *Met. IX*, but rather the dispositions of finite things and people. In *Met. IX*, Aristotle talks about architects and people of other arts and sciences, about blind and seeing animals, about sitting and standing men, about flute players, sperms and wooden boxes. These are all finite things having finite dispositions, i.e. dispositions that do not have all of eternity at their disposal for realising themselves. Thus, a principle about “unqualified possibilities” would be of no help at all in explaining the teaching of *Met. IX*. Therefore, the principle of plenitude is nei-

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<sup>19</sup> Lovejoy 1936.

ther a plausible nor helpful starting point when making sense of Aristotle's theory of *dynamis*.

As different as Hartmann's and Hintikka's interpretations are, they do have something in common. Both analyse Aristotle's *dynaton* solely in terms of modal operators, i.e. as being the Greek equivalent of something like "It is possible that ..." or, in logical notation, " $\Diamond p$ ". As I have argued in the last two sections, such a translation is both syntactically and ontologically misleading if we care about the *dynaton* that is related to a disposition. Who, like me in this paper, cares about Aristotle's theory of dispositions has to analyse *dynaton* as a predicate modifier, which is both truer to the Greek syntactical constructions that Aristotle uses to ascribe dispositions and more appropriate for representing the ontological structure underlying these ascriptions.

#### A9. *The Megarian challenge*

Aristotle himself has to defend his theory of dispositions against an alternative position put forward by a group of philosophers called "Megarians" that has some similarities with Hartmann's account of total possibility.<sup>20</sup> Aristotle describes this position as follows:

There are some who say, as the Megarians do, that a thing can act only when it is acting, and when it is not acting it cannot act, e.g. that he who is not building cannot build, but only he who is building, when he is building [...]. (Met. IX 3, 1046a 29-32)

The Megarians, that is, regard the realisation of something both necessary and sufficient for having the disposition for doing this:  $x$  has a disposition to do or to be  $F$  at  $t$  if and only if  $x$  is actually  $F$  at  $t$ . Aristotle formulates no less than four arguments against this position showing which strange conclusions (*atopa*, 1046a 33) such a position would entail:

(1) Learning a craft is different from (and more difficult than) merely switching from non-employing to employing a craft. If the builder would not have any building disposition when not building, there would be no difference between a non-building builder and someone who is not a builder at all.

(2) Also, there would be no difference between a thing being perceivable and that thing being perceived (and Protagoras would be right), for then a thing would be perceivable if and only if it would actually be perceived.

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<sup>20</sup> On the attempts to identify these philosophers cf. section 4.1.1.

(3) Also, people would frequently become blind and deaf when closing their eyes or entering a silent room.

(4) Finally, Megarians do away with change and becoming (and Parmenides rejoices) because if there is no principle of change to become something not yet existing, nothing can ever come into existence that is not yet present.<sup>21</sup>

To be sure, none of the strange consequences makes it necessary for the Megarians to withdraw their claim. They could as well (and maybe they did) embrace the Parmenidean and Protagorean implications. However, any philosopher who, like Aristotle, sees some value in common-sense opinions and rejects positions that are more revisionary than necessary has plenty of reasons to reject the Megarian claim. This is the lesson Aristotle learns from the discussion of the Megarian position. Contrary to the Megarian claim, terms for the possession of a disposition and terms for their respective realisation usually have different extensions. This is possible because, as a rule, dispositions are “two-sided”: It is possible to have a disposition and not realise it at the same time.

Therefore, it is necessary to distinguish between the time *at which* something has a disposition and the time *for which* this disposition allows a realisation. At daytime an owl already possess the disposition to realise an enormous visual perception when it is dark at night. Here, daytime is the *at-time*, i.e. the time at which the owl has that disposition, whereas the night is the *for-time*, i.e. the time for which that disposition allows a realisation.

Disposition ascriptions in natural language contexts normally do not contain any reference to a *for-time*. Thus, it should come as a surprise that some criticise such an analysis because “it does not make sense to speak of a capacity for standing-at-t, but only for standing”.<sup>22</sup> But there is help on the way: We can get rid of the *for-time* without falling back in the Megarian mess. The syntactical trick that I will employ is to turn the free variable that the reference to the *for-time* has been in our previous formulations into a bound variable. The ontological idea behind this is that as a relevant causal factor for its realisation, a disposition precedes its effect. Thus, the realisation of a hitherto unrealised disposition could happen at some time in the future given that the disposition does not get lost in between. Hence, if something has at *t* a disposition to do or to be *F*, this disposition at least allows its bearer to display the

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<sup>21</sup> For a formal account of this last argument cf. section 4.1.3.

<sup>22</sup> Waterlow 1982, 40.

realisation of  $F$  at some  $t^*$  immediately after  $t$ . This means that we interpret a *dynamis* as a causal factor that precedes its effect and may (but need not) be co-present with its realisation.

#### A10. Dispositions, realisations and their conditions

In the Megarian picture, there was an intimate interconnection between having a disposition or *dynamis* and realising it. According to the Megarians, something has a *dynamis* when and only when realising it. In this picture, displaying the realisation is both necessary and sufficient for having the respective *dynamis*. Now, Aristotle had struggled to argue against the Megarian position and establish the possibility of unrealised dispositions. This means that the display of the realisation can no longer be regarded as being a necessary condition for having a disposition, nor can it be regarded as a sufficient condition for having a disposition if co-presence with its realisation is only a contingent and not a necessary feature of a *dynamis*.

As he disposed of with the Megarian position, Aristotle presents a new necessary condition for having a disposition: For  $x$  to have a disposition to do or to be  $F$ , it must be logically consistent to assume that  $x$  actually does or is  $F$ .<sup>23</sup> Such an assumption will lead to contradictions if we, e.g., assume that the diagonal of the square has the disposition to be measured with the same unit as the length of one side.<sup>24</sup>

Now, when does a disposition become realised? This question does not arise in the Megarian picture because there a *dynamis* does not exist at all before it is realised.<sup>25</sup> However, as Aristotle allows for unrealised disposition, there is a real question for him. He answers it by referring to the conditions that have to be met in order for a disposition to be realised:

[...] as regards *dynamis* of the latter kind [of the non-rational *dynamis*], when the agent and the patient meet in the way appropriate to the disposition in question, the one must act and the other be acted on [...]. (Met. IX 5, 1048a 5-7)

In this passage, Aristotle draws on the contrast between rational and non-rational dispositions. This distinction and its relevance for this passage will be

<sup>23</sup> On this principle cf. Weidemann 1999a.

<sup>24</sup> The proof is to be found in Euclid, El. X 117; it is alluded to in APr I 23, 41a 26-7 and I 44, 50a 35-38. For the details of the argument cf. section 4.3.4.

<sup>25</sup> Within the Megarian picture, it may, however, be asked how and when a *dynamis* or its realisation can come into existence at all. We know of no answer from the Megarian side on these questions, nor do we know whether the Megarians bothered about these questions at all.

discussed in the next section. Meanwhile, it suffices to say that Aristotle here talks about non-rational dispositions only, i.e. such dispositions that can also be had by non-living things, plants or beasts. Such dispositions, or so Aristotle says in this passage, are realised when the bearer of the active power (the “agent”) and the bearer of the complementary passive disposition (the “patient”) meet in an “appropriate way”, which normally includes a spatial vicinity of the bearers of complementary active and passive dispositions, but may also include further appropriate marginal conditions. Note that these conditions are conditions for the realisation of a disposition, not for having the disposition. Otherwise Aristotle would not have managed to evade the Megarian problems. Moreover, the realisation conditions of a *dynamis* belong to the definition of the *dynamis* in question: If we talk about *dynameis* with different realisation conditions, we talk about different kinds of *dynameis*. For this reason, Aristotle does not need to include a “if nothing external interferes” phrase into his account when a *dynamis* becomes realised.<sup>26</sup> Two standard realisation conditions are that the *dynamis* does not cease to exist and that no hindrances like antidotes are present (and, thus, Aristotle has an answer to some problems of the theory of dispositions).<sup>27</sup>

Finally, we may wonder whether the non-realisation is necessary for having a disposition or not. I.e., are „being F according to the disposition“ and „being F according to the realisation“ compatible or incompatible predicates? There are certainly incompatible cases, like having a disposition for automatic self-destruction. Having such a disposition surely is not compatible with its realisation, for if it is realised, there is no longer a bearer that could be the bearer of this disposition. On the other hand, there are cases where having a disposition clearly is compatible with realising it. A medical practitioner, for example, does not lose his power to heal his patients when he actually does so. Otherwise he would be constantly losing and re-gaining his power when beginning or ending the treatment of his patients.

#### A11. Rational dispositions

A very special variety of dispositions are the so-called rational dispositions (*dynameis meta logou*, cf. Met. IX 2, 1046b 2). There are several reasons for calling them rational dispositions. First, Aristotle describes these dispositions by

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<sup>26</sup> On this cf. Moline 1975.

<sup>27</sup> On “finkish” (i.e. disappearing) dispositions cf. Martin 1994; on antidotes cf. Bird 1998.

saying that they are present in the rational part of the soul. This means that they cannot be had by non-living things, plants or mere beasts. Second, these dispositions are accompanied by a *logos*, a rational formula like a definition of the realisation. Third, the acts that are realisation of these dispositions come about by means of ratiocination, i.e. by means of practical syllogisms. What this means can be illustrated with the help of the art of medicine, which is Aristotle's stock example for this kind of dispositions. The "rational formula" that accompanies the art of medicine is the *logos* or definition of health. Starting from such a definition of the form "Health is XYZ", the medical practitioner can deliberate which means he has to choose to heal his patients:

Health is XYZ.  
 XYZ will come about if I do F.  
 I can do F.

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Thus I will do F.

A special feature of rational dispositions is that they can have contrary realisations. Medical knowledge is normally used to heal patients, but an evil doctor can use that very same knowledge to kill people. Thus, the art of medicine can have effects as distinct as health and death. Therefore, the realisation of rational dispositions cannot be triggered as simply as the non-rational dispositions discussed in the preceding section. It is clear that spatial vicinity between a medical practitioner and an ill patient does not automatically lead to a realisation of the practitioner's healing disposition. First, the practitioner has to decide to activate his medical knowledge, but this is not enough. The practitioner has also to decide on his goal: Does he want his patient healthy or dead? Only then is he able to ratiocinate on possible means to the end chosen by him, which will eventually lead to appropriate actions that may bring about the patient's health or the patient's death.<sup>28</sup>

### A12. *Natures and habits*

The different kinds of *dynamis* that I discussed up to now are not the only causal properties that Aristotle knows of. Other causal properties are natures and habits, *phuseis* and *hexeis*. But what are natures for Aristotle? Aristotle often remarks that a nature, a *physis*, is a principle of movement.<sup>29</sup> *Physis*, thus,

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<sup>28</sup> For a more detailed account cf. section 2.4.

<sup>29</sup> Cf. Phys. II 1, 193a 28ff; III 1, 200b 12f; An. II 1, 412b 17; Met. V 4, 1015a 15-19; XI 1, 1059b 17f.



has the same genus as *dynamis*. But what is its specific difference? Aristotle spells this out in the following passage:

And I mean by *dynamis* not only that definite kind which is said to be a principle of change in another thing or in the thing itself regarded as other, but in general every principle of movement or of rest. For nature (*physis*) also is in the same genus as *dynamis*; for it is a principle of movement – not, however, in something else but *in the thing itself qua itself*. (Met. IX 8, 1049b 5-10, tr. Ross, italics mine; cf. Cael. III 2, 301b 17-19)

Thus, whereas an active power is a principle of change “in another or as another”, a *physis* is a principle of change in a thing “in itself qua itself” and whereas an active power needs a complementary passive disposition in order to be realised, there is no such need for a *physis*. If something has a *physis* to do or to be *F*, the realisation is only dependent on the appropriate marginal conditions, but not on the spatial vicinity of the bearers of other causal properties.

Another kind of causal properties goes under the name of *hexis*. Like *dynamis*, *hexis* is a word with many different meanings, to which Aristotle dedicates a chapter in his dictionary of ambiguous philosophical terms (Met V 20). The noun *hexis* derives from the verb *echtein*, “to have”. As this etymology indicates, a *hexis* is in general either the having of something or that which is had by something. As a further possible meaning, Aristotle proposes the following definition:

*Hexis* means a disposition (*diathesis*) according to which that which is disposed is either well or ill disposed, and this either in itself (*kath'hauto*) or with reference to something else (*pros allo*). (Met. V 20, 1022b 10-12)

What is of particular interest for us are the *hexeis* of the non-rational faculties of the soul, which determine both our emotional reactions and many of our actions. Traditionally, these *hexeis* are called virtues and vices: Virtues if they dispose for good acting, vices if they dispose for bad acting.

At first sight, a virtue like justice has a structure similar to a *dynamis*. At a given time, someone can have the virtue without acting justly, e.g., when sleeping, and when the just person is acting justly, the virtue of justice is thought to have a causal influence. Thus, virtues (and vices) are also realisable and causal properties, but Aristotle takes great pain in distinguishing non-rational virtues from rational *dynamis*, for we have seen that in the case of a rational *dynamis*, like the art of medicine, one and the same *dynamis* can be the cause of contrary realisations, i.e. of health and death. The art of calculating just prices is such a rational *dynamis* – but like medicine, this art can be used to

calculate and to charge just as well as unjust prices (cf. NE V 1; Plato, *Hippias Minor*). He who has the virtue of justice does not only know what is just, he is also inclined to do so. Thus, while a rational *dynamis* allows for contrary realisations, a virtue is directed to one realisation only, and while a rational *dynamis* needs an appropriate will and goal in order to be realised, a virtue informs the will by itself and does not need the addition of a goal of action from the outside.

*A13. Does the unmoved mover possess dispositions?*

Finally, I want to turn to one of the most prominent elements of Aristotle's metaphysics, the godly unmoved mover who keeps the heavens revolving. Now, we may ask whether the unmoved mover possesses any dispositions, any *dynamis*. In *Met.* IX 8, where Aristotle argues for the priority of realisations over dispositions, we find contradictory evidence on this matter. There (in 1050b 8-11), Aristotle says the following:

- (Z1) "Every *dynamis* is at the same time [a *dynamis*] for the opposite."
- (Z2) "For, while that which is not capable (*dynaton*) of being present in a subject cannot be present,"
- (Z3) "everything that is capable (*dynaton*) of being may possibly (*endebetai*) not be actual."

Taken together, (Z1) and (Z3) suggest that what is eternal has no *dynamis* because, for him, everything that is eternal is necessary and cannot not be (*Cael.* I 12). However, if we accept this, then we are forced to say that whatever eternal things do is not based on a *dynamis* to do this, but in between (Z1) and (Z3) we find evidence for the contradictory claim because (Z2) formulates the following principle of enabling:

Everything that happens happens because there have been *dynamis* that enabled this happening. Otherwise it would not have happened.

If this is universally valid, whatever an eternal entity is (or does) is based on a *dynamis*, too. We are obviously faced with a trilemma:

- (A1) What is eternally *F* is necessarily *F*.
- (A2) What is eternally *F* has the *dynamis* to be *F*.
- (A3) All *dynamis* are two-sided.

These three propositions are jointly incompatible. Now, (A1) is no topic in *Met.* IX, but is being argued for in *Cael.* I 12 and Aristotle nowhere presents

any doubts. We may, thus, reject (A2) or (A3). To reject (A2) is to reject the principle of enabling, to reject (A3) is to admit “one-sided” dispositions, i.e. dispositions that are necessarily realised. That we do, indeed, have these options is confirmed through a passage in *De Interpretatione* 13:

For the term *dynaton* is not said with one meaning only (*ouk haplós*), but at one time it is true that it is realised, as when someone [is said] to be able (*dynaton*) to walk because he walks, and generally when something is able [to be something] because that which it is said to be able of is already realised, but sometimes because something may be realised, as when a man [is said] to be able to walk because he may walk. The latter belongs only to that which is changeable; the former can also belong to the unchangeable things. [...]. Now, while the one way to be *dynaton* cannot truly be said of things being necessary in the unqualified sense, the other [way to be *dynaton* can be predicated] truly. (Int. 13, 23a7-16; my translation)

The author here clearly distinguishes between an inclusive and an exclusive predication of being *dynaton* to do or to be something. In an inclusive manner, it is said, even unchangeable and necessary things (like the unmoved mover) can be said to be *dynaton* to do or to be something. Thus, whoever wants to ascribe *dynamis* to the unmoved mover has to accept that these *dynamis* are never unrealised. Otherwise we should refrain from ascribing *dynamis* to the unmoved mover. This would still not imply that what the unmoved mover does is inexplicable, for, as we have seen, Aristotle knows principles of change and being like natures that go beyond the sphere of *dynamis*.

#### A14. *Is it a good theory?*

Aristotle's philosophy has often been criticised. Notably, Hobbes dismissed Aristotelian thinking as “vain philosophy” and claimed “that scarce any thing can be more absurdly said in naturall philosophy than that which is called Aristotle's Metaphysics”.<sup>30</sup> In particular, Aristotle's theory of *dynamis* has been the object of many disputes. There are three standard objections against it: (1) Aristotle's powers, dispositions and potentialities create a ghostly world of *possibilia*, (2) they are explanatorily idle (the *virtus dormitiva* objection) and (3) they are empirically inaccessible. I will discuss and reject each of these objections in turn.<sup>31</sup>

<sup>30</sup> Hobbes, *Leviathan*, ed. Tuck, 461.

<sup>31</sup> Cf. also ch. 7 and Jansen 2004.

The first objection attacks the purportedly dubious ontological status of *dynameis*. They are said to form a “ghost world” between being and not-being<sup>32</sup> or to be a kind of “half-being”<sup>33</sup>. In fact, I have already answered this objection when explaining the Bearer Principle and the Principle of Actuality. A power or disposition is nothing ghostly, nor something that has only half-being: It is a full-fledged property of a full-fledged thing. It is, however, a full-fledged property with a certain peculiarity: It is related to some action, passion or another property, which it enables or causes, and which, thus, is called the realisation of the disposition. Now, it is possible, that a disposition occurs without being realised, but this does not diminish the ontological status of the disposition itself (but relates only to non-occurring of the realisation at this time).

The second objection says that referring to dispositions does not explain anything, but rephrases in new words the problem in question. Instead, it is claimed, science has rather to explain phenomena by describing the world’s micro structure. This objection is often put forward in connection with Molière’s joke at the expense of the medical profession in his *Le Malade Imaginaire*. There, a to-be doctor of medicine answers during his doctoral *viva voce* examination:<sup>34</sup>

I have been asked by the learned Doctor to name cause and reason why opium makes sleepy. To this I answer: Because there is a sleepy making disposition (a *virtus dormitiva*), whose Nature is to lull to sleep.

Though in the play the examination board is full of praise for this answer, it is not apt to raise admiration for the medical profession on behalf of the spectator. Obviously, this answer does indeed only rephrase the problem. It is not informative at all, but this does not imply that science can do without dispositions. First, the answer is not informative because the question already presupposes that it is the opium which is the relevant causal factor. If asked why someone fell asleep after a dose of opium, it would actually be informative to point out that the job had been done by the opium and not by some other thing present in this situation. Second, how could an informative answer to the original question look like? We could point out that opium consists of 37 alkaloids, among which is morphine, but this would only be a satis-

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<sup>32</sup> Hartmann 1938, 5 (“Gespensterdasein”).

<sup>33</sup> Tegtmeier 1997, 36-40 (“Halbexistenz”).

<sup>34</sup> On this scene and its background in the philosophical and theological discussions of Molière’s time cf. Hutchinson 1991.

fiable explanation if we know that morphine has a *virtus dormitiva*. Of course, we can also ask why morphine has such a dormitive virtue and we could refer to some molecular structures in our nervous system and to the molecular structure of the morphine. Again, this answer can only be satisfiable if we know something about the dispositions of the molecular structures in question, e.g., that the morphine molecules have the disposition to bind to and, thus, to activate certain receptors in our nervous system and that the respective parts of our nervous system have the matching passive disposition. Again, we have not totally eliminated the talk of dispositions, but only replaced the talk of one disposition through the talk of another disposition. This shows that we cannot explain anything by referring to properties of microstructures by using categorical property terms only. We always need dispositional property terms, too.

The third objection claims that dispositions are empirically inaccessible because we perceive realisations only. Therefore, they are a monster of bad metaphysics. Obviously, we should be careful with this kind of argument, for by a similar token of argument the whole 'external world' would be empirically inaccessible and, thus, a monster of bad metaphysics because we are acquainted with 'internal' sense data only. The natural reaction to this would be to say that we perceive the world *through* our senses and sense data. In a similar way, dispositions are not only described in terms of their realisations, but also recognised *through* them. Along such lines, Aristotle admits the epistemological priority of the realisation through which the *dynamis* can be recognised (Met. IX 8, 1049b 13-17). Although the realisation is prior, the *dynamis* can, nevertheless, be recognised: By showing his students calculating, a teacher of mathematics can give evidence that his students have acquired the *dynamis* for calculations and, thus, prove the efficiency of his tuition (1050a 17-19).

Hence, Aristotle needs not be impressed by these three objections. His account of dispositions can still be regarded as a consistent ontology of causal properties with an enormous explanatory appeal.

## B. Das Problem des Neuen: Wie kreativ sind Veränderungsprinzipien?

### B1. *Der Ort der Kreativität in der Philosophie des Aristoteles*

Kreativität ist in einem ersten, weiten Sinn die Fähigkeit, etwas hervorzubringen. Im engeren Sinn ist Kreativität aber die Fähigkeit, Neues zu schaffen, etwas bisher noch nicht Dagewesenes. Wenn es um die Analyse des Hervorbringens geht, sollte Aristoteles eine einschlägige Autorität sein, ist Aristoteles doch der große Analytiker der veränderlichen und sich verändernden Welt, der Bewegungen und ihrer Ursachen. Doch hat Aristoteles auch zum Neuen, also zur Kreativität im engeren Sinn etwas zu sagen?

Was vom Standpunkt des Herstellenden ein Hervorbringen ist, das ist vom Standpunkt des Hergestellten ein Entstehen: ein substantieller Wechsel, eine Veränderung in der ersten Kategorie. Nicht jeder kreative Prozeß muß ein Ding neu hervorbringen. Dinge können auch bloß kreativ verändert werden. Sie können z.B. einen neuen Anstrich bekommen: ein Eigenschaftswechsel, eine Veränderung in der Kategorie der Qualität. Sie können größer oder kleiner gemacht werden: Veränderungen in der Kategorie der Quantität. Man kann sie an neuen, vielleicht ungewohnten Orten wiederfinden: eine Ortsveränderung. Und sie können zu anderen Dingen neu in Beziehung gesetzt werden. Doch dies ist nach Aristoteles keine eigene Art der Veränderung, sondern eine, die auf den vier anderen Arten von Veränderung beruht und auf diese zurückgeführt werden kann (Met. XIV 1, 1088a23-35 u.ö.).

Um welche Art von Veränderung es sich auch immer handelt, es ist die Aufgabe der Wissenschaften, nach ihren Prinzipien und Ursachen zu suchen (Phys. I 1, Met. VI 1). Und „Prinzip von Veränderung und Bewegung“, das ist für Aristoteles in erster Linie eine *dynamis*. In einer ersten Annäherung kann man sagen: Eine *dynamis* ist eine Eigenschaft der in Veränderungsprozesse als Verursacher oder Erleider der Veränderungen involvierten Substanzen, die für das Zustandekommen der Veränderung kausal relevant ist. Zwei Dinge erschweren die Annäherung an die *dynamis*. Erstens ist *dynamis* für Aristoteles kein einheitlicher Begriff. Zweitens ist die *dynamis* nicht das einzige Prinzip der Veränderung, das Aristoteles kennt. Zunächst muß daher das Aristotelische Feld der hervorbringenden Prinzipien erkundet werden, wozu auch die *physis*, die Natur, gehört. *Dynamis* ist dann also nur ein kreatives Prinzip unter anderen (§ 2). Zudem setzt Aristoteles der Kreativität von *dynamis* und *physis*

enge Grenzen. In seiner Argumentation für die Priorität der Verwirklichung gegenüber dem Vermögen plädiert Aristoteles für die These, daß ein Vermögen stets nur hervorbringen kann, was zuvor schon dagewesen ist. Eine *dynamis* oder *physis* wäre im engeren Sinn höchst unkreativ, weil sie stets nur das hervorbringt, was schon gewesen ist (§ 3). Ist Aristoteles' Argument wirklich wasserdicht? Es gibt doch offensichtlich Neues nicht nur in der Geschichte (§ 4), sondern auch in der Natur (§ 5). Die Diskussion dieser Beispiele wird dazu führen, Aristoteles' Position differenzierter zu sehen. Dennoch bleibt die Frage, ob er die Entstehung von Neuem im Laufe der Geschichte erklären kann (§ 6).

## B2. *Dynamis und Physis als Prinzipien der Veränderung*

Was für Aristoteles eine *dynamis* ist, läßt sich nicht durch eine einfache Definition wiedergeben. Denn *dynamis* ist für Aristoteles kein einheitlicher Begriff, sondern umfaßt eine ganze Familie von Begriffen, die durch *Pros-hen*-Relationen und Analogieverhältnisse zusammengehalten wird (Met. V 12, IX 1 und 6). Zu dieser Begriffsfamilie gehört zunächst der Begriff des Aktivvermögens, das Veränderungen in anderen Dingen verursacht. Komplementär dazu ist das Passivvermögen, das es Dingen erlaubt, durch die Einwirkung eines fremden Aktivvermögens verändert zu werden. Dazu gesellen sich die qualifizierten Vermögen, die es erlauben, etwas planvoll und erfolgreich auszuführen, und die Widerstandsvermögen, die es einem Ding erlauben, sich einer Veränderung zum Schlechten zu widersetzen.<sup>1</sup>

Aristoteles führt allerdings immer wieder eine Begriffsbestimmung des Aktivvermögens an, das er als Hauptbegriff der *dynamis* herausstellt (*kyrios horos*, Met. V 12, 1020a4). Nach dieser Begriffsbestimmung ist ein Aktivvermögen „das Prinzip (*arché*) der Bewegung (*kinesis*) oder Veränderung (*metabolé*) in einem anderen oder insoweit es ein anderes ist (*en heteró ê hê heteron*)“ (Met. V 12, 1019a15f).<sup>2</sup>

Auch die *physis*, die Einzelnatur der Dinge, bezeichnet Aristoteles an vielen Stellen als Prinzip der Bewegung,<sup>3</sup> sie teilt also das Genus „Prinzip der Bewegung“ mit der *dynamis*. Doch wo ist die spezifische Differenz, die man diesem

<sup>1</sup> Vgl. Kap. 2 und 3 für Ausführlicheres zur Begriffsfamilie *dynamis*.

<sup>2</sup> Vgl. auch Cael. III 2, 301b18f; Met. V 12, 1020a4; IX 1, 1046a10; IX 2, 1046b4; IX 8, 1049b7.

<sup>3</sup> Vgl. Phys. II 1, 193a28ff; III 1, 200b12f; An. II 1, 412b17; Met. V 4, 1015a15-19; XI 1, 1059b17f.

Genus hinzufügen muß, um den Begriff der *physis* im Unterschied zur *dynamis* zu erhalten? Aristoteles erläutert dies in Met. IX 8:

„Ich meine aber mit *dynamis* nicht nur die Art, von der man sagt, sie sei Prinzip der Veränderung in einem anderen oder als anderes (*en alló é bé allo*), sondern allgemein (*holós*) jedes Prinzip von Bewegung und Ruhe. Denn die *physis* ist in demselben Genus wie die *dynamis*; sie ist nämlich ein Prinzip der Bewegung, aber nicht in einem anderen, sondern in demselben als es selbst (*en autó bé auto*).“ (Met. IX 8, 1049b5-10; meine Übers.)<sup>4</sup>

Eine Natur ist also ein Prinzip der Bewegung oder Veränderung in etwas, insofern es dieses ist, ein Vermögen ein Prinzip der Bewegung in einem anderen oder insofern es ein anderes ist. Für das Verständnis dieser Begriffsbestimmungen kommt es nun darauf an, was die Formulierungen „in etwas, insofern es dieses ist“ und „in einem anderen oder insofern es ein anderes ist“ bedeuten. Aristoteles erläutert die Bedeutung von solchen Ausdrücken wie „insofern“, „als“ oder „qua“ am Beispiel des Innenwinkelsatzes (APo I 4, 73b33-39; vgl. SE 6, 168a40-b4): Das Dreieck hat eine Innenwinkelsumme von  $180^\circ$  qua Dreieck, so Aristoteles, nicht aber qua Fläche oder qua Spitzwinkliges. Es hat diese Innenwinkelsumme nicht qua Fläche, weil nicht alle Flächen diese Innenwinkelsumme haben; es hat ihn nicht qua Spitzwinkliges, weil auch andere Dreiecke diese Innenwinkelsumme aufweisen. Das Haben einer Innenwinkelsumme von  $180^\circ$  und Dreiecksein implizieren sich also gegenseitig, und beide Implikationsrichtungen sind relevant, weil wir diese Innenwinkelsumme sonst auch dem Dreieck qua Fläche oder dem Dreieck qua Spitzwinkligem zuschreiben müßten. Ein Satz der Form „x ist F qua G“ kann also genau dann als wahr angesehen werden, wenn gilt: (1) x ist F, und (2) x ist G, und (3) F und G implizieren einander notwendigerweise (Kap. 2.1.4).

Mithilfe dieser Wahrheitsbedingungen für qua-Sätze können die beiden Aristotelischen Veränderungsprinzipien *dynamis* und *physis* näher bestimmt werden. Sei F ein Prinzip der Veränderung für die determinable Eigenschaft G und x der Träger von F. Dann gilt:

- F ist ein *Aktivvermögen*, wenn die Veränderung von G, wenn sie durch F geschieht, nicht in x geschieht *oder* wenn die Veränderung von G, wenn sie durch F geschieht, zwar in x geschieht, aber F und G sich nicht notwendigerweise wechselseitig implizieren.

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<sup>4</sup> Ähnlich Cael. III 2, 301b17-19.



- F ist eine *Natur*, wenn die Veränderung von G, wenn sie durch F geschieht, in x geschieht *und* F und G sich notwendigerweise wechselseitig implizieren.
- F ist ein *Passivvermögen*, wenn die Veränderung von G, wenn sie durch F geschieht, in x geschieht und F und G sich *nicht* notwendigerweise wechselseitig implizieren.

### B3. Die Priorität der Verwirklichung vor dem Vermögen

*Dynamis* und *physis* sind also insofern kreativ, als sie hervorbringende Prinzipien sind. Doch sind sie auch kreativ im engeren Sinn? Können sie auch Neues hervorbringen, noch nie Dagewesenes? Zweifeln läßt Aristoteles' These von der zeitlichen Priorität der Verwirklichung bezüglich des der Art nach Identischen, für die er in Met. IX 8 argumentiert. Aristoteles sagt explizit, daß die Ausführungen von IX 8 für alle Prinzipien der Bewegung gelten sollen (vgl. § 2); die Ausführungen des Kapitels sind also für beide Arten von hervorbringenden Prinzipien relevant.

Zunächst räumt Aristoteles ein, daß es für eine Verwirklichung zunächst ein Vermögen geben muß, das dieser Verwirklichung zeitlich vorhergeht und sie ermöglicht, und daß alles, was der Verwirklichung nach etwas ist, aus etwas entsteht, das dies dem Vermögen nach war: Der Mensch entsteht aus bestimmtem Stoff, Getreide aus dem Samen und der Sehende ‚entsteht‘ aus dem Sehfähigen (1049b19-23). Doch führt Aristoteles dies nur aus, um dann zu sagen:

„Aber zeitlich früher (*protera tōj chronōj*) als diese [d.h. Stoff, Same und Sehfähiger] sind andere [Dinge], die der Verwirklichung nach sind (*onta energeia*), aus denen diese entstanden. Immer nämlich entsteht aus dem dem Vermögen nach Seienden das der Verwirklichung nach Seiende durch ein der Verwirklichung nach Seiendes, wie zum Beispiel der Mensch aus dem Menschen, der Gebildete durch einen Gebildeten, indem immer irgend etwas als Erstes bewegt. Das Bewegende aber existiert bereits der Verwirklichung nach. Es ist aber in den Abhandlungen über das Wesen gesagt worden, daß jedes Entstehende entsteht aus etwas Bestimmtem (*ek tinos ti*) und durch etwas (*hypo tinos*), und dieses ist der Art nach (*tōj eidei*) das gleiche [wie das Entstehende].“ (Met. IX 8, 1049b23-29 ; meine Übers.)

Die Beispiele machen das Bild, das Aristoteles vorschwebt, recht deutlich: Der Mensch entsteht z.B. aus dem Samen,<sup>5</sup> aber der Same stammt von einem bereits der Verwirklichung nach seienden Menschen. Der Gebildete entsteht aus dem Ungebildeten, aber unter Einwirkung eines gebildeten Lehrers, der bereits über das Wissen verfügt, das der Schüler erwerben soll. So setzt das, was vermögend ist etwas zu werden, ein anderes voraus, das das, was ersteres nur zu werden vermögend ist, bereits der Verwirklichung nach ist. In diesem Bild scheint kein Platz für Neues zu sein: Die Naturen und Vermögen bringen stets nur hervor, was zuvor bereits gewesen ist; die hervorbringenden Prinzipien scheinen also höchst unkreativ zu sein.

Hinsichtlich der zeitlichen Priorität ist Aristoteles' These: „Das, was der Art nach (*eidei*) das gleiche ist, ist früher verwirklicht, nicht aber, was der Zahl nach (*arithmô*) [dasselbe ist].“ (1049b18f)<sup>6</sup> Darin stecken zwei Behauptungen, nämlich (P1) die zeitliche Priorität des Vermögens bei numerisch Identischem und (P2) die zeitliche Priorität der Verwirklichung bei der Art nach Identischem:

- (P1) Sei *a* ein Individuum und *F* eine Tätigkeit. Dann gibt es für jeden Zeitpunkt  $t_2$ , zu dem *a* *F*- $t_2$ , einen früheren Zeitpunkt  $t_1$ , an dem das Individuum *a* das Vermögen hat zu *F*-en.
- (P2) Sei *G* ein *eidos* und *F* eine Tätigkeit. Dann gibt es für jeden Zeitpunkt  $t_2$ , zu dem ein unter *G* fallendes Individuum das Vermögen hat, zu *F*-en, einen früheren Zeitpunkt  $t_1$ , zu dem ein unter *G* fallendes Individuum *F*- $t_1$ .

In (P2) geht es um „das, was der Art nach dasselbe ist“ (*tôj eidei to auto*, 1049b18). Das heißt, es geht um Dinge, die demselben *eidos* angehören. Aristoteles' Beispiele des Menschen und des Gebildeten zeigen, daß es hier nicht nur um biologische Arten, sondern auch um erworbene Eigenschaften geht. Aristoteles begründet (P2) mit einem Lehrsatz aus seiner Theorie des Entstehens:<sup>7</sup> „Immer nämlich entsteht aus dem dem Vermögen nach Seienden das

<sup>5</sup> In Met. IX 7 argumentiert Aristoteles dafür, daß der Samen noch nicht „Mensch dem Vermögen nach“ ist (vgl. Kap. 5.3.1); das Beispiel beruht also auf einer von Aristoteles selbst nicht geteilten Meinung. Vgl. Furth 1985, 135: „a loose example“.

<sup>6</sup> Zur Unterscheidung von numerischer und spezifischer Identität vgl. Top. I 8, 103a8-14.

<sup>7</sup> Grayeff 1974, 203 meint, an anderen Stellen des Corpus Aristotelicum „the opposite doctrine“ von (P2) zu lesen. Seine vermeintlichen Belege dafür drücken aber entweder (P1) aus (wie GC I 3, 317b16f, Met. VII 7, 1032b31f) oder haben überhaupt nichts mit dem Thema von IX 8 zu tun, wie etwa die begriffliche Unterscheidung zwischen „früher dem Vermögen nach“ und „früher der Verwirklichung nach“ (Met. V 11, 1019a6f). Auch in Phys. IV 6, 213a6f und Met. VIII 6, 1045b21 geht es nicht darum, daß „the potential and the actual exist simultaneous-

der Verwirklichung nach Seiende durch ein der Verwirklichung nach Seiendes, [...] indem immer irgend etwas als Erstes bewegt.“ (1049b24-26) Keine Bewegung also ohne Beweger – und der Beweger muß der Verwirklichung nach sein, denn bloß potentielle Beweger bewegen eben nicht. Bis dahin ist aber noch nichts darüber gesagt worden, von welcher Art der Beweger sein muß, nur daß ein bloß potentielles Sein nicht ausreicht. Für den nächsten Schritt im Argument verweist Aristoteles auf seine Ausführungen zur Veränderung in den „Abhandlungen über das Wesen“, die uns wahrscheinlich in Met. VII 7-9 überliefert sind. Dort habe er gezeigt: „jedes Entstehende entsteht aus etwas Bestimmtem (*ek tinos ti*) und durch etwas (*hypo tinos*), und dieses ist der Art nach (*tōj eidei*) das gleiche [wie das Entstehende].“ (1049b27-29) Das Argument macht also die komplexe Annahme, daß ein dem Vermögen nach F-Seiendes  $S_1$  stets aufgrund der Einwirkung eines Seienden  $S_2$  entsteht, für das gilt (Kap. 6.3.1):

- (V1)  $S_1$  ist von  $S_2$  verschieden.
- (V2)  $S_2$  ist zeitlich früher als  $S_1$ .
- (V3)  $S_2$  ist der Verwirklichung nach.
- (V4)  $S_2$  gehört wie  $S_1$  zur Art der F-Seienden.

Daraus folgt dann, daß die Verwirklichung von  $S_2$  früher ist als das Vermögen von  $S_1$  und daß dies eine Verwirklichung eines der Art nach Identischen ist. Wenn es um das Problem des Neuen geht, steht natürlich vor allem (V4) im Zentrum der Kritik.

#### B4. Neues in der Geschichte

Gegen die These von der Priorität der Verwirklichung hinsichtlich des der Art nach Identischen liegt der Einwand nahe, daß es aber doch Neues gibt, daß immer wieder neues passiert. Spricht nicht der Commonsense eindeutig gegen diese Behauptung des Aristoteles? Aristoteles selbst meint in Rhet. I 6, 1363a27, der Teilnehmer einer Beratungsrede solle seine Sache so darstellen, daß er zu etwas rät, „was niemand [getan hat]“ (*ha medeis*) und daher etwas Besonderes und Außergewöhnliches ist und viel Ehre verspricht. Auch von Verbrechen und Krankheiten sagt Aristoteles, daß sie ein erstes Mal vorkommen können (Rhet. I 12, 1372a27f). Die Anlage der Aristotelischen Rhetorik erlaubt es uns nun aber nicht, aus diesen Bemerkungen des Rhetorikers Aris-

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ly“, sondern um deren diachrone Identität: Sie sind „eines“ bzw. „dasselbe“, aber zu verschiedenen Zeiten.

toteles eine entsprechende These auch des Philosophen Aristoteles abzuleiten. Denn der Redner soll, so Aristoteles, gerade nicht auf das wissenschaftlich erwiesene und begründbare zurückgreifen, sondern auf das, was die Menge seiner Hörer geneigt ist anzunehmen. Und damit die Menge glaubt, etwas sei zum ersten Mal passiert, reicht es aus, wenn keine anderen Fälle *bekannt* sind; es ist nicht notwendig, daß es keine anderen Fälle *gegeben* hat.

Verbindlicher für den Philosophen Aristoteles ist seine Analyse der Herstellung oder *poiesis* in Met. VII 7. Die Formursache, die für die Entstehung eines neuen Hauses kausal relevant ist, ist kein präexistentes wirkliches Haus, sondern das Wissen des Architekten um die Form des Hauses. Daher muß (V3) modifiziert werden: S<sub>2</sub> ist entweder ein der Verwirklichung nach seiendes G oder eine Seele, in der die Form G als Wissen verwirklicht ist. Um damit (V4) zu stützen, muß man annehmen, daß es sich bei beidem um dasselbe *eidōs* handelt. Dies ist innerhalb des Aristotelischen Theorie-Rahmens plausibel, da es sich ja tatsächlich um die gleiche Form, das gleiche *eidōs*, handelt, die nur auf zwei verschiedene Weisen instantiiert ist: Entweder in einem Stoff als Zugrundeliegendem oder eben in der Seele des Handelnden, die als *forma formarum* für alle Formen empfänglich ist (An. III 8, 432a1-3). Das Problem des Neuen entscheidet sich dann an der Frage, wo denn das Wissen des Architekten herkommt. In Met. IX 8 ist der Lernprozeß eines von Aristoteles' Paradebeispielen: Das Wissen des Schülers ist zuvor schon im Lehrer verwirklicht. Das wirft natürlich die Frage auf, was Aristoteles mit Autodidakten anfängt und mit solchen Schülern, die schließlich mehr wissen als ihre Lehrer.<sup>8</sup>

Zu diesem Punkt sind Aristoteles Äußerungen zu historischen Prozessen aufschlußreich. Die Philosophie ist für Aristoteles beispielsweise etwas Entstandenes: Es gibt sie, weil die ägyptischen Priester Muße hatten, Wissenschaft zu betreiben (Met. I 1, 981b23ff). So entstand die Philosophie und mit ihr Philosophen, so scheint es, ohne daß es zuvor Philosophen gegeben hätte. Doch legen andere Stellen nahe, daß Aristoteles dieses Geschehen am Nil nicht als die erste Erfindung der Philosophie ansieht. So heißt es in Met. XII 9, 1074b10-13 und an anderen Stellen<sup>9</sup>, daß jede Kunst und jede Philosophie oftmals entdeckt und dann wieder vergessen wird. Wenn das stimmt, dann hat es vor den ägyptischen Priestern bereits Philosophen gege-

<sup>8</sup> Anders als bei den Naturprozessen scheint hier auch nicht das Vermögen oder Potential des Schülers vom Wissen des Lehrers abzuhängen, sondern nur die Möglichkeit des Lernprozesses.

<sup>9</sup> Vgl. Cael. I 3, 270b19f und Mete. I 3, 339b27-30, wo Aristoteles gar ein wiederkehrender Wissenszyklus vor Augen zu schweben scheint (*anakyklein*, 339b29).

ben und die Entstehung der Philosophie war nicht die Entstehung von etwas Neuem, sondern von etwas bereits dagewesenem. In Pol. VII 10, 1329b25ff behauptet Aristoteles ähnliches von staatlichen Einrichtungen, die bereits unendlich oft erfunden worden seien.<sup>10</sup> Jaakko Hintikka führt diese Stellen an, um seine These, Aristoteles sei ein Anhänger des „Fülleprinzips“ („principle of plenitude“) gewesen, auch für den Bereich der Geschichte zu stützen.<sup>11</sup> Das Fülleprinzip besagt in Hintikkas Formulierung: „Keine uneingeschränkte Möglichkeit bleibt in unendlicher Zeit unverwirklicht.“<sup>12</sup> Da Aristoteles von der Anfangslosigkeit der Zeit ausgeht, ist also zu jedem Zeitpunkt der menschlichen Geschichte schon unendlich viel Zeit vergangen, in der alle Möglichkeiten verwirklicht worden sein müssen. Nichts Neues also in der Geschichte?

Aber auch wenn man Aristoteles zugesteht, daß die Philosophie am Nil nicht zum ersten Mal erfunden worden ist, bleibt ein Problem für die von ihm behauptete Entstehungsverursachung durch Artgleiches. Denn die Entstehung der Philosophen in Ägypten ist auf keinen Fall ein Prozeß, der durch die in anderen Zeitaltern präexistierenden Philosophen verursacht wird. Auch wenn alles schon einmal da war, heißt dies nicht, daß alles von Artgleichem hervorgebracht wird. Dies wird auch an den antiken Zyklentheorien der Staatsverfassungen deutlich. Jeder Monarchie mag eine andere Monarchie vorhergegangen sein, jeder Diktatur eine andere Diktatur. Aber unmittelbar geht der Diktatur z.B. die Monarchie vorher, und die Diktatur entsteht eben nicht durch eine Ferneinwirkung der früheren Diktatur, sondern durch die Entartung der unmittelbar vorhergehenden Monarchie.

### B5. *Neues in der Natur*

Klarer als die Wirrnis der menschlichen Geschichte ist vielleicht die Natur. Wir Modernen sehen spätestens seit Lamarck, Darwin und Mendel in der Natur ständig Neues entstehen. Die biologische Evolution ist eindeutig kreativ und bringt Arten hervor, die es zuvor nicht gegeben hat. Aber das ist ein Problem, das sich Aristoteles in dieser Form noch nicht gestellt hat. Daher sollte man meinen, daß Aristoteles es als Anhänger der Artkonstanz leicht

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<sup>10</sup> Ähnlich Pol. II 5, 1264a1-5.

<sup>11</sup> Vgl. Hintikka 1973. Zur Geschichte des Fülleprinzips vgl. Lovejoy 1936. Anders als nach ihm Hintikka sieht Lovejoy Aristoteles als Gegner des Fülleprinzips. Vgl. dazu Kap. 1.3.1 und 162-167.

<sup>12</sup> Vgl. Hintikka 1973, 96; meine Übersetzung.

hat, die Priorität der Verwirklichung hinsichtlich des der Art nach Identischen aufrecht zu erhalten. Denn dann scheint doch zu gelten: Die Entstehung eines Lebewesens einer bestimmten Art wird durch mindestens ein Lebewesen derselben Art verursacht. Oder im Beispielfall, wie Aristoteles immer wieder betont: Der Mensch entsteht aus dem Menschen.<sup>13</sup> Das Lebewesen aus der Elterngeneration ist bereits der Verwirklichung nach ein Lebewesen dieser Art, während der von ihm hervorgebrachte Same – wenn überhaupt – erst noch dem Vermögen nach ein solches Lebewesen ist. Dann geht jedem Wesen, das dem Vermögen nach ein Lebewesen dieser Art ist, ein anderes Wesen zeitlich vorher, das der Verwirklichung nach ein Lebewesen dieser Art ist.

Doch gibt es einen Vertreter des Tierreichs, der Aristoteles gehörig Probleme einbringt: den Maulesel. Denn der zeigt eindeutig, daß Kinder und Eltern nicht derselben biologischen Art angehören müssen. Der Maulesel kann gar kein Nachkomme von Mauleseln sein; vielmehr sind Maulesel, wie auch Aristoteles weiß, unfruchtbar (vgl. GA II 7, 746b12-20 und II 8). Er ist Nachkomme eines Pferdes und einer Eselin, stammt also von Eltern ab, die selber keine Maulesel sind. Aristoteles diskutiert das Maulesel-Problem in Met. VII 8 und schlägt folgende Lösung vor: Zwar ist der Maulesel nicht Nachkomme eines Maulesels. Aber es gibt eine Gattung, für die es im Griechischen zwar keinen Namen gibt, der aber sowohl der Maulesel als auch seine Eltern angehören. Maulesel, Esel und Pferd gehören also zu einer gemeinsamen Gattung; nennen wir diese „Pferdeartige“. Dann geht zwar dem Maulesel qua Maulesel nichts Verwirklichtes derselben Art voraus, wohl aber dem Maulesel qua Pferdeartigem: Denn der Maulesel ist ein von Pferdeartigen abstammender Pferdeartiger. Wenn diese Lösung Geltung haben soll, dann muß offensichtlich (P2) modifiziert werden: Die zeitliche Priorität der Verwirklichung hinsichtlich des der Art nach Identischen kann nicht mehr für jedes beliebige *eidos* behauptet werden, zum Beispiel nicht mehr für die Spezies der Maulesel (wenn diese denn eine Spezies bilden). Es muß ausreichen, daß es für jedes Individuum *eine* solche Gattung gibt, die diese Bedingung erfüllt.

Eine ähnliche Einschränkung wird auch durch ein anderes Problem erforderlich, das Aristoteles in Met. VII 9 diskutiert. Vieles, was durch eine Kunst entstehen kann, kann auch ohne diese Kunst entstehen (1034a9f), zum Beispiel die Gesundheit: Ein Patient kann auch von alleine gesund werden, ohne

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<sup>13</sup> Vgl. dazu auch Oehler 1962.

daß er den Rat eines Arztes einholt. Aristoteles erklärt derartige spontan ablaufende Prozesse dadurch, daß ein Stoff manchmal das notwendige Bewegungsprinzip von Natur aus in sich hat und deshalb das externe Bewegungsprinzip der Kunst nicht notwendig ist (1035a10-14). Der Arzt würde beispielsweise durch sein medizinisches Wissen erkennen, daß dem Patienten Wärme zugeführt werden müßte (VII 7, 1032b8). Ein Feuer, das den Patienten wärmt, kann nun aber auch zufällig, ohne Mittun eines Arztes, den Patienten wärmen und diesen dadurch heilen (1034a17f). Das bereits der Verwirklichung nach seiende Andere ist in diesem Fall das Feuer. Das Feuer ist *per se* (*kath' hauto*) Ursache des Wärmens, und es ist der Verwirklichung nach warm, während der Patient vorerst nur dem Vermögen nach warm ist. Dadurch, daß das Feuer den Patienten wärmt, ist es akzidentell (*kata symbebêkos*, vgl. Phys. II 3, 194a32-35) auch Ursache der Gesundheit. Offensichtlich findet (V4) also keine Anwendung auf die akzidentelle Verursachung: Das Feuer hat nicht die Form der Gesundheit. Hinsichtlich der *per se*-Ursache hat (V4) aber auch bei spontanen Prozessen Gültigkeit; dies spricht dafür, die entsprechende Prioritätsthese auf die Fälle der *per se*-Verursachung zu beschränken.

#### B6. Woher das Neue?

Die bisherige Diskussion hat gezeigt, daß die These von der zeitlichen Priorität der Verwirklichung bezüglich des der Art nach Identischen nicht so uneingeschränkt gültig ist, wie es in Met. IX 8 den Anschein hat. Diese Einschränkung der Gültigkeit dieser Prioritätsthese schafft Platz für das Entstehen von Neuem.

Das Maulesel-Problem macht erstens deutlich, daß Aristoteles die Priorität nicht für alle *eidōs*-Begriffe aufrecht erhält. Bei jeder Entstehung oder Veränderung soll es einen Begriff geben, für den die Prioritätsthese gilt, aber sie muß nicht für alle Begriffe gelten, unter die das Entstandene fällt. Bezüglich vieler Eigenschaften sind also Variationen möglich, und das Maulesel-Beispiel zeigt, daß diese Variationen selbst in der Kategorie der Substanz vorkommen können.

Zweitens hat das Phänomen der Spontanheilung gezeigt, daß Aristoteles die Prioritätsthese auf *per se*-Verursachung beschränkt wissen will. Für Neues ist also Platz im Bereich des Akzidentellen und im Bereich der akzidentellen

Veränderungen. Dies kann etwa durch das Zusammentreffen von kausalen Einflüssen aus ganz unterschiedlichen Quellen geschehen.<sup>14</sup>

Eine dritte Möglichkeit des Entstehens von Neuem könnte durch die Steigerbarkeit vieler Eigenschaften gegeben sein. Dies würde erklären, wieso Schüler ein Instrument oft besser spielen als ihre Lehrer: Das Vermögen zum Kitharspielen war zuvor im Lehrer bereits als Kitharspielen verwirklicht, in so weit ist die Prioritätsthese unangefochten. Doch scheint es dem Schüler möglich zu sein, ein Vermögen zu erwerben, das ihm das Kitharspielen in größerer Perfektion erlaubt als es sein Lehrer beherrschte.<sup>15</sup>

In allen drei Fällen gilt, daß es unter den vielen Beschreibungen, die es für das Entstandene und das Hervorbringende gibt, *eine* Beschreibung gibt, für die die Prioritätsthese gilt: Pferdeartige zeugen Pferdeartige, das Warme wärmt den Patienten, der Kitharspieler lehrt das Kitharspielen. So beschrieben erscheinen die Beispiele höchst unkreativ zu sein. Aber unter anderen Beschreibungen erscheinen diese Fälle durchaus als Entstehung von Neuem: Pferd und Eselin zeugen den Maulesel. Gesundheit ist keine Eigenschaft, die das Feuer hat; trotzdem bringt das Feuer die Gesundheit des Patienten hervor. Der durchschnittliche Kitharspieler kann ein exzellenter Lehrer sein und so durch seinen Unterricht einen exzellenten Kitharspieler hervorbringen. Die Fähigkeit zum exzellenten Spiel aber war im Lehrer noch nicht zuvor verwirklicht.

Die Prioritätsthese ist also kein Hindernis, daß Neues nicht auch innerhalb des Aristotelischen Weltbilds entstehen kann. Allerdings gibt es für Aristoteles keine Kreativität als besondere *Fähigkeit* für kreative Neuschöpfungen. Ein Prinzip für das Entstehen von Neuem als solchem kann es für Aristoteles nicht geben. Die Entstehungsprinzipien, die beim Entstehen von Neuem mitwirken, sind zunächst einmal Prinzipien für das Entstehen von bereits Vorhandenem. Die Kombination mehrerer solcher Prinzipien aber schafft die *Möglichkeit* für Neues. Für das Neue, insofern es neu ist, kann es daher auch keine Erklärung seines Entstehens geben, sondern nur insofern es Elemente des Alten, schon dagewesenen, enthält.

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<sup>14</sup> Vgl. das berühmte Beispiel vom Gang zum Marktplatz in Phys. II 4: Was den Marktbesucher veranlaßt, den Markt aufzusuchen, hat nichts zu tun mit dem Umstand, daß er dort in der Lage ist, sein Geld einzutreiben, aber in diesem Fall fügt es sich eben, daß beide Ursachen zusammenkommen.

<sup>15</sup> Vgl. dazu die ausführliche Diskussion von Lernprozessen in Kap. 6.4.



## C. Planners, Deciders, Performers.

### Aristotelian Reflections on the Ontology of Agents and Actions

#### C1. *Agents, Actions and Aristotle*

Aristotle did not write a book about action theory, nor on the ontology of agents. Though, of course, he touches on actions in many of his works: in his works on ethics, in his work *On the soul*, in the biological part of his work where he discusses the movements of animals and also in the *Physics* where he is concerned with change in general. However, opinion is divided how these somewhat scattered remarks are to be evaluated. Some, like John Ackrill,<sup>1</sup> think that Aristotle tampered with his remarks on action and that his account is seriously inconsistent. Others, like David Charles, think there is such a thing as a consistent theory of action in Aristotle, and indeed Charles wrote a voluminous book to reconstruct this theory.<sup>2</sup>

In what follows, I, too, want to combine several of Aristotle's scattered remarks on action to yield a coherent picture. I do not necessarily want to attribute the very picture to Aristotle himself, but I consider this picture to be Aristotelian in two ways. Firstly, it was inspired by Aristotle's work. Secondly, it is intended to represent a theory that is consistent with the remarks on agents and actions in Aristotle's extant works.

#### C2. *Actions Successful by Performance*

Where does an action come from? What is its origin, its *archê*, as Aristotle would call it, its originating principle? Aristotle is quite explicit on this point: An action's *archê* is the decision (*prohairesis*) to perform this action.<sup>3</sup> I will say more about decisions in due course. First, I want to ask: Which are the actions I can decide on? I want to argue that these actions are not all those I can perform. I may wish to:

- think about philosophical problems
- study philosophy
- aim at a degree in philosophy

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<sup>1</sup> Ackrill 1978.

<sup>2</sup> Charles 1984.

<sup>3</sup> Cf. NE VI 2, 1139a 31-33; Met. V 1, 1013a21; Jedan 2000, 129-131.

- get a degree in philosophy
- become a professor of philosophy
- become the leading intellectual figure of the 21st century.

Maybe I will be successful and all my six wishes will be fulfilled. Then we could, retrospectively, confirm that back then (i.e. now) I was, indeed, able to perform all these six things. Thus, I may start today to become the leading intellectual figure of the 21<sup>st</sup> century, but is this something I can decide on? No, I cannot. To assume such an ability would be sheer nonsense. Whether someone becomes the leading intellectual figure of any century is no matter of decision, nor can I decide to get a degree in philosophy or to become a professor, but I can decide to think about philosophical problems, I can decide to study philosophy and I can also decide to *aim* at a degree in philosophy, but whether I *will* get a degree and whether I *will* become a professor of philosophy or not does not depend on my decisions alone, but also on many other factors.

Is there a common description of those actions which only depend on my decisions to perform them? Yes, there is. These actions consist in the exercise of one of the agent's capacities and they do not require any other criterion over and above that capacity's exercise to be successful (Met. VIII 8, 1050a 34-b 2). We can, thus, picture an agent as an agglomeration of his capacities and the agent can decide which of these capacities he wants to exercise. Now, having the capacity and exercising it guarantees the success of the action in all those cases where the success just consists in the exercise of the capacity. In these cases Aristotle's "perfect-test" indicates that the *telos* of the action, the action's goal, has been reached: If I exercise the capacity to F, then – *ipso facto* – I have exercised the capacity to F.<sup>4</sup>

Aristotle uses the perfect-test to draw his distinction between movements and changes on the one hand and activities which are neither movements nor changes on the other hand: his famous distinction between *kinesis* and *energeia*. For a change or movement (*kinesis*) like walking from Gloggnitz to Kirchberg, it is not true that the action's goal (= being in Kirchberg) is fulfilled while the action is performed. Quite the other way round: When the goal has been reached, the action is over. With an activity (*energeia*) the perfect test yields the opposite result: The goal of an *energeia* (like being in Kirchberg or seeing Wittgenstein's house) is fulfilled if and only so long as the action goes on and

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<sup>4</sup> Cf. Met. IX 6, 1048b 23-35 and section 3.3 above; cf. also Jansen 1997 and 1999.

the goal that is analytically connected with the exercise of a capacity is just the exercise of that capacity.<sup>5</sup>

Aristotle knows an intellectual virtue for choosing the right action – the *phronesis*, which might be translated as “practical wisdom” (NE VI, 1140a 24–b 11). It is the duty of the *phronesis* to decide which *praxis* the agent should perform and a *praxis* is just an action of the previously described kind: An action whose success is guaranteed by our decision to perform it, given that we have the appropriate capacity.

### C3. *Actions as Causes*

Actions that are successful by performance do not exhaust all actions. This is nicely shown by the phenomenon of trying, for if an action is successful once we start with it, it seems to be nonsense to say that we try such an action. Those actions we can try to do no-nonsensically must be of a different kind. Of course, there is no special “trying capacity” such that trying would be an exercise of this specific capacity. When we try something, we exercise the very same capacities we exercise in successful cases. Thus, the difference between merely trying and having success cannot lie in the exercise of our capacities alone – we have to search for it “outside” in the surroundings of the agent, for, I will claim, we can only then no-nonsensically try to F if “F” is an action-description that does more than simply name the agent’s capacities that are to be exercised, and this bit more is to prescribe a certain change that has to be brought about in the world.

My applying my pushing ability with respect to my car will, hopefully, bring about my car moving from its previous place A to some other place B. I am, obviously, not only applying my pushing ability, but also pushing the car from A to B. Whether my pushing the car to B will be successful or not is not determined by the fact of the actualising of my pushing ability alone – in addition, the car has to arrive at B. Therefore, pushing the car from A to B is not a *praxis*, it is *poiesis* (NE VI, 1140a 1–6). The paradigm case of a *poiesis* might be, say, a potter’s producing new pottery or an architect’s building a new house. A *poiesis* aims at producing something in addition to the action itself. The product of the pushing is not a new three-dimensional thing like pottery

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<sup>5</sup> This gives us also a clue for a definition of omission. Given the set of the agent’s capacities, we may say that if an agent omits to F, then (1) he does not F, but (2) has the capacity to F. For, presumably, we do not want to say that an agent omits actions he is not capable of.

or a new house, which would belong to the ontological category of substance. The product in question is “only” something new in the category of place. Other actions may bring about new qualities, quantities or relations. Nevertheless, any such action qualifies as a *poiesis*.

We have, thus, to distinguish three elements on the side of the agent: the decision, *praxis* and *poiesis*. On the side of the material being manipulated, the patient, we can add the experience of a change (the *kinesis*) or in verbal expressions: the *prattein* and *poiein* of the agent (doing and making) and the *pathen* of the patient. The intellectual virtue responsible for a good *poiesis* is no longer *phronesis*, but *technê*, the knowledge of a certain craft or art. The *technê* for healing is the art of medicine and the *technê* for building a house is what architects have to learn (NE VI, 1140a 6-23).

In some cases, these different parts of an action might be distributed to different persons. For example, a farmer may deliberate with his wife about what to do with their cow. Finally, the farmer might decide that the cow has to be milked. However, he does not himself perform this action, but delegates the performance to his assistant, his farm-hand. The farm-hand in turn will milk the cow and, thus, bring about a change in quantity of the milk in the cow’s udder. In this action, three human beings and an animal are involved: The farmer and his wife are the planners with the farmer being the decider, the farm-hand is the performer and, last but not least, the cow is the patient. A similar example is the case of building a house in modern times as well as in ancient Greece: The *architekton* deliberates and decides, the slaves move the stones and the stones and the rest of the building material is, collectively, the patient that is transformed into a house.<sup>6</sup>

However, all four roles can also coincide in one person. Aristotle’s stock example for this case is the medical practitioner who cures himself (Phys. II 1, 192b 23-27).<sup>7</sup> Practitioners and patients are not normally numerically identical, but, of course, if Hippocrates has a flu, he can cure himself. In this case, Hippocrates plays both the role of the practitioner (who is planner, decider and performer) and the role of the patient to be healed (who is also the patient in my technical use of this term). Quite similar is the case of walking,

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<sup>6</sup> Cf. Makin 2000, 154 for another example: „A crippled doctor, who retained that [medical] understanding, who could not administer treatments herself, but who could guide others, would retain her medical skills, because such a doctor would be a source of health in her patient.“

<sup>7</sup> Cf. section 2.1.4.

which has caused much trouble for modern commentators.<sup>8</sup> When I decide to walk from Gloggnitz to Kirchberg, I decide to exercise my walking ability combined with the intention to aim at reaching Kirchberg. Of course, this case differs from the case where I was pushing my car. Now, one might say I am pushing myself. Subject and object of the action, agent and patient are one and the same person. On the one hand I have myself as the agent, on the other hand myself as the patient. Also in this case, I do not move myself as itself, as Aristotle would put it, but myself as something different. I am the mover or the agent in this case insofar as I exercise my walking ability. Nevertheless, we have to distinguish between this ability, the ability to fill a certain amount of space and to be located at different places. The latter is what grounds my being the patient of this action. Hence, we receive the result that such an ordinary thing like walking makes us somewhat schizophrenic: Insofar as I have the ability to walk I move myself insofar as I have the ability to be located at different places. While I share the ability to walk with several higher animals only, the ability to be located at different places is a property of most extended bodies.<sup>9</sup>

#### *CA. Where Decisions Come From*

Now, how does a decision occur? Aristotle models this by means of the practical syllogism.<sup>10</sup> A practical syllogism is a piece of practical reasoning that connects a major premise expressing general knowledge (like, “I should eat healthy food”) and a minor premise expressing a particular observation (like, “This is healthy food”). These two premises lead to the conclusion that I should eat that stuff in front of me and, thus, the practical syllogism can lead to a concrete action (MA 7, 701a 7-30; NE VII, 1147a 24-36; An. III 11, 434b 16-21).

What does it mean for such a major premise to be reasonable? It means to be integrated in a coherent hierarchy of means-ends-relations. Aristotle does not elaborate on these structures, but one thing is clear from his writings on ethics: For such structures to be meaningful, there must be at least one ultimate end, an end that is not a means to an other end, but being pursued for its own sake (NE I, 1097a 25-34). Further down the hierarchy we find ends

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<sup>8</sup> Cf. Ackrill 1965; Pickering 1977.

<sup>9</sup> For such distinctions within the same individual cf. Phys. VIII 4, 254b 28-33.

<sup>10</sup> This is a much debated topic; cf. among others: Cooper 1975, Kenny 1979, Mele 1981.

that are themselves means for other higher ends and so on until we reach the ultimate end. This ultimate end is, which we can construe formally following Aristotle, happiness and living well (*eudaimonia*, NE I 5, 1097a 34-b 20).

Practical deliberation, then, has at least two aspects. First, there are practical syllogisms like the example mentioned resulting in concrete actions. When is this action complete? That is determined by the type of activity or process this action belongs to. This *telos* of the action itself – the “action’s purpose” or “*finis actionis*” – has to be distinguished from whatever the agent performs this action for – the “agent’s purpose” or “*finis agentis*”.<sup>11</sup> The agent’s purpose is not an intrinsic property of the agent’s activity, but an integral element of the agent’s process of practical reasoning. Thus, it is extrinsic to the action itself. We can determine the agent’s purpose only if we know enough about the agent’s deliberation leading to that action. As in our example, the agent’s eating that very food is supposed to support his health. Actions of the very same type can be given totally different purposes by their agents. E.g., while the intrinsic purpose of singing is just the singing itself, performers may sing for a variety of different extrinsic purposes: to produce something beautiful, to have fun, to earn money or to court a woman.

Different actions of the same agent will, presumably, be performed because of different purposes. And here the second aspect of practical deliberation enters the scene, for it should be desirable for the agent to pursue purposes that fit into a coherent scheme. There will be some purposes that have only instrumental value for him to serve other purposes, which rank higher in that agent’s hierarchy of purposes, which in turn serve even higher purposes, which ultimately are thought to contribute to the agent’s happiness. Thus, the planner not only has to decide whether he can realize a certain end in a given situation, but also which will be the right means to reach happiness.

### C5. *The Picture So Far*

If we summarise the account given so far, we get the following picture of the different parts of an action and, analogously, the different parts an agent consists of:

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<sup>11</sup> Cf. Freeland 1985, 400-401; STh II-II q. 141 a. 6 ad 1; Ross 1936, 517-518 on Phys. II 5, 196b 17-22.

| AGENT                                |                                    |   |   | PATIENT<br>( <i>pathetikos</i> ) |                                  |
|--------------------------------------|------------------------------------|---|---|----------------------------------|----------------------------------|
| PLANNER                              | DECIDER                            | PERFORMER                                   |   |                                  |                                  |
|                                      |                                    | DOER<br>( <i>praktikos</i> )                | MAKER<br>( <i>poietikos</i> )                       |                                  |                                  |
| Deliberation<br>( <i>bouleusis</i> ) |                                    |   |   |                                  |                                  |
| brings about →                       | Decision<br>( <i>prohairesis</i> ) |   |   |                                  |                                  |
|                                      | brings about →                     | Exercise of a<br>capacity ( <i>praxis</i> ) |   |                                  |                                  |
|                                      |                                    | brings about →                              |   | <i>poesis</i> of the<br>agent    |                                  |
|                                      |                                    |   |   | brings about →                   | <i>kinesis</i> of the<br>patient |
|                                      |                                    |   | brings about →<br><i>energeia</i><br>of the patient |                                  |                                  |

For non-intentional causal interactions – normal events one might say – we can take over this picture, skipping the deliberation process. Normal events do not come from decisions. They are triggered by natural causal processes (witness their different treatment in Met. IX 7), but the rest remains basically the same, even if we may wish to change some of the labels, as Aristotle seemingly wished to do. He talks about *praxis* and *poiesis* only with respect to human actions. In normal events, we can conceptually draw a distinction along analogous lines. Aristotle, however, has no distinct names to apply here. Both are interchangeably called *energeia* or *entelecheia*.<sup>12</sup>

The following diagram represents in outline a non-intentional interaction. The three columns in this scheme correspond to three different kinds of capacities that are involved in causal interaction: the agent’s “active capacity” to bring about a change, the patient’s “passive capacity” to undergo a change and the patient’s capacity to be in the new state brought about by the

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<sup>12</sup> Cf. Chen 1958a, Blair 1967, and section 3.1.2 above.

change.<sup>13</sup> The two columns belonging to the patient represent the two kinds of results connected with a change: the “resulting change” and the “result of change”<sup>14</sup>, i.e. the change itself and the new state brought about by it.

| AGENT                               | PATIENT   |   |
|-------------------------------------|---|---|
| The agent’s changing of the patient |   |   |
| brings about →                      | The patient’s being changed (= the <i>kinesis</i> of the patient) |   |
|                                     | brings about →  | The patient’s being in the new state brought about by the change (= the new <i>energeia</i> of the patient) |

### C6. Three Problems

There seem to be rather strange overlaps and redundancies in this picture. I will discuss here the following three difficult distinctions: (1) between decision and *praxis*, (2) between *praxis* and *poiesis* and (3) between *poiesis* of the agent and *kinesis* of the patient. Here is how I would try to account for these:

(1) Are the decision and the *praxis* really two different events? Even for Aristotle, to decide for a certain action and to perform this action are different types of things, but one and the same token. The conclusion of the practical syllogism is at the same time the end of practical deliberation and the beginning of acting (An. III 10, 433a 16-17). One might compare this with a point dividing a certain length of a line (a comparison used by Aristotle himself, though for another purpose in An. III 2, 427a 10-14). Just like this point is the end of one length and the beginning of the other, the conclusion is the end of deliberation and the beginning of acting. Thus, one and the same individual playing two roles at the same time can be subsumed to two different types of events. Thus, the decider is the limit case between the deliberator and the performer.

<sup>13</sup> Berti 1990.

<sup>14</sup> Von Wright 1963, 39-41.



(2) *Praxis* and *poiesis* are being enabled by the very same capacity. Insofar as the realisation happens within the agent or has the agent as its logical subject, it is a *praxis*. Insofar as the realisation happens within the patient, it is a *poiesis*. Many kinds of *praxis* can only co-occur with a *poiesis*, but a *praxis* without *poiesis* is possible, and, indeed, Aristotle thinks that the most valuable kind of *praxis* is of this kind, namely contemplation (*theoria*). This possibility allows us to distinguish conceptually between *praxis* and *poiesis* in the other cases, as well.

(3) The *poiesis* of the agent and the *kinesis* of the patient may be judged to be the same event. However, this event is being called *poiesis*, insofar as it is the realisation of a capacity of the agent and it is called *kinesis*, insofar as it is the realisation of a capacity of the patient. Of course, we know that the agent's capacity will only be realised if the patient's capacity will be realised and *vice versa*. Thus, *poiesis* and *kinesis* necessarily occur at the same time. This is analogous to Aristotle's theory of perception. A perception is at once the realisation of the active capacity of the perceptible thing and of the passive capacity of the perceiver. These two capacities can only be realised together and Aristotle tells us that they both happen within the same individual, namely the perceiver. Though, of course, the perceptible thing remains the logical subject of the realisation of its capacity (in the end, it is *its* capacity that is being realised), it would be odd to say that something happens within the perceptible thing when being perceived. Perception does not really change something within the perceptible thing, but only about the perceiver.

### C7. *The Intentional and the Non-Intentional*

In Aristotle's picture, the two main elements of acting, namely intentionality and performance, are neatly separated. They can be re-discovered in the two elements decision and *praxis*. With a *praxis*, insofar as it is a *praxis*, its success is guaranteed. All those elements of an action whose success is not guaranteed enter as *poiesis* or *kinesis* or via the agent's practical deliberations. An action's result, i.e. the end-state of the patient's *kinesis*, does not necessarily correspond to the intended result.<sup>15</sup> The result brought about by the action is not always the result aimed at in the decision: If I go to the market place to buy fruits, this might also lead to the collections of debts because I meet by acci-

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<sup>15</sup> For this distinction between the *beneka tou* of an action and the aim *kata probairesin* cf. Phys. II 5, 196b 17-22.

dent one of my debtors (Phys. II 5, 196b 33-36). Intention is, thus, not necessary for a certain result. On the other hand, intention is not sufficient. The general practitioner who intends to cure his patients cannot be sure of his success. All he can say is that he does the best according to his knowledge and the state of the medical art (Top. I 3). All he can decide on is whether to activate his medical skills. This is what is *eph' hemin*, i.e. what is entirely in his own power to do. But whether his endeavours will be crowned with success, whether the patient will actually be cured – this depends not only on the medic's skill, but also on the state the patient is in and maybe on other intervening causes.<sup>16</sup>

At its basic level, this sketch of a model of actions takes into account only decisions for or against the exercise of active capacities. Is it possible to decide on the exercise of passive capacities, too? Sun bathing seems to be a case in question. Can't we decide on whether our skin should get a darker complexion? Well, let's have a closer look at the elements of sun-bathing that are really intentional. We can decide on going to a sunlit place, we can decide on staying there for some time with an uncovered body, and we can do this with the intention of getting a darker complexion, but whether the pigments in our skin will be stimulated by the sunlight to change their colour, whether there are such pigments in the first place or not, this is not our business. We cannot decide on these matters because with respect to these things we are not autonomous agents, but simply subject to the causal happenings in nature.

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<sup>16</sup> These are, of course, all those factors relevant for the realization-conditions of the respective capacity. Cf. Met. IX 5 and, commenting on this, Moline 1975 and section 5.2 above.

# Literatur

Auf Werke klassischer Autoren, Kommentare und Hilfsmittel wird mit Hilfe von Siglen bezug genommen, die im Literaturverzeichnis aufgeschlüsselt werden. Andere Literatur wird nach dem Schema „Autor[en] Jahreszahl [, Seitenzahl]“ zitiert; die vollständige Literaturangabe wird im Literaturverzeichnis nachgetragen. Das Literaturverzeichnis enthält nur die tatsächlich verwendete Literatur; weitere Literatur verzeichnen Flashar 1983 und Radice/Davis 1997.

Im Text werden griechische Wörter transkribiert; dabei steht  $\epsilon$  für den griechischen Buchstaben Eta,  $\sigma$  für den griechischen Buchstaben Omega,  $b$  für den Spiritus asper. Ein Iota subscriptum wird nur wiedergegeben, wenn es für die Bedeutung relevant ist; dann wird für es ein  $j$  an den Vokal angehängt, unter dem es steht.

Übersetzungen fremdsprachiger Zitate stammen, wenn nicht anders angegeben, vom Verfasser. In den Übersetzungen stehen (wie in den Textausgaben) spitze Klammern „<“, „>“ um Ergänzungen im griechischen Text zu kennzeichnen. Eckige Klammern „[“, „]“ kennzeichnen Ergänzungen in der Übersetzung, denen keine Ergänzungen im griechischen Text entsprechen: Durch sie soll der konzise Stil des Aristoteles lesbarer und eindeutiger gemacht werden, wobei durch die Klammerung deutlich wird, daß es sich bereits um eine erste interpretatorische Leistung handelt. Die Transkriptionen der im Griechischen verwendeten Termini sind in runden Klammern „(“, „)“ ergänzt; ebenfalls in runden Klammern stehen in der Regel Passagen, die der Herausgeber des griechischen Textes entsprechend in Parenthese gesetzt hat. Bei den Zeilenangaben bedeutet ein „f“ „und die folgende Zeile“, „ff“ bedeutet „und die beiden folgenden Zeilen“; umfaßt eine Belegstelle mehr als drei Zeilen, sind Anfangs- und Endzeile angegeben.

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\* Der Kommentar zu Met. IX ist wohl pseudepigraphisch. Vgl. Moraux 1942, 14-19 und 1967, 181: „Zuerst muß daran erinnert werden, daß der zweite Teil (Bücher E-N) des unter Alexanders Namen erhaltenen Metaphysik-Kommentars sicher nicht echt ist. Es fragt sich bloß, ob sein Verfasser (wahrscheinlich Michael von Ephesus) den ihm noch zugänglichen Kommentar Alexanders lediglich erweitert und hier und dort modifiziert, oder ob er einen von Alexander unabhängigen Kommentar verfaßt hat, der sich dem genuinen Werk Alexanders substituiert hätte.“

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# Verzeichnis der logischen Symbole

## *Aussagenlogische Symbole*

|           |   |
|-----------|---|
| $\neg$    | „Es ist nicht der Fall, daß“ (Satznegation) |
| $\&$      | „und“ (Konjunktion)                         |
| $\vee$    | „oder“ (Alternation)                        |
| $\supset$ | „wenn ..., dann“ (materiales Konditional)   |
| $\equiv$  | „genau dann, wenn“ (Äquivalenz)             |

## *Quantoren*

|           |   |
|-----------|---|
| $\forall$ | „Für alle ... gilt“ (Allquantor)                |
| $\exists$ | „Für mindestens ein ... gilt“ (Existenzquantor) |

## *Modallogische Symbole*

|                       |   |
|-----------------------|---|
| $\diamond$            | „Es ist möglich, daß“ (Möglichkeitsoperator, 19-20)       |
| $\square$             | „Es ist notwendig, daß“ (Notwendigkeitsoperator, 19-20)   |
| $\square \rightarrow$ | „wenn ... wäre, dann“ (kontrafaktisches Konditional, 194) |

## *Prädikatmodifikatoren*

|                   |  |
|-------------------|--|
| $\sim$            | „nicht“ (Prädikatnegation, 31)                         |
| $\cdot$           | „und“ (Prädikatkonjunktion, 183)                       |
| adyn              | „hat nicht das Vermögen zu“ (Vermögensmodifikator, 33) |
| dyn               | „hat das Vermögen zu“ (33)                             |
| dynamei           | „ist dem Vermögen nach“ (116)                          |
| int <sub>i</sub>  | „mit Intensität i“ (Intensitätsmodifikator, 31)        |
| laut <sub>i</sub> | „mit Lautstärke i“ (31)                                |
| Perf              | „hat ge-“ (Perfektivmodifikator, 129)                  |
| phys              | „ist/wäre von Natur aus“ (68-69)                       |
| pot               | „ist potentiell“ (Potentialitätsmodifikator, 197-198)  |
| qual <sub>i</sub> | „mit Qualität i“ (Qualitätsmodifikator, 234)           |

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