# Aristotle's Theory of Causal Action in Physics III 3[1]

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Aristotle's theory of causal action as presented in *Physics* III 3 has usually been taken to be quite straightforward. According to the tradition, when an agent acts on a patient, the change is located in the patient. If the patient reacts on the agent, then the agent is a patient in the new relation. If the agent is moved not by a reaction on the part of the patient, but by something else, then it is not the primary agent. It is an intermediate mover which is ultimately moved by a primary unmoved mover. On this analysis the primary agent is unmoved. There are two reasons why this view has seemed plausible. First, if the primary agent is moved, then an unmoved mover of any sort would seem to be impossible. Secondly, if both the agent and patient undergo changes, but not different changes, then this passage is in conflict with Aristotle's stipulation in *Physics* V 4 that a single motion presupposes a single subject that undergoes the change.

It is common nowadays to speak of Aristotle's theory of four αἰτίαι as a theory of different kinds of explanation of why a thing is or acts as it does. This is no doubt correct and is certainly the account we need in order to make sense of Aristotle's material, formal, and final αἰτίαι, and some of his examples of efficient αἰτία, such as the art of building, which he sometimes says is the efficient cause (or because) of the house. This paper is primarily concerned with those things that are not merely reasons, but also *causes* of change, that is, with efficient causes that function as agents — those things that do the pushing and pulling — and the question is whether the agent, i.e. the doctor, builder, or teacher, is changed when it produces a change in something else. The issue is not whether the agent is changed by a correlative reaction on the part of the patient, or whether the agent is changed by some further cause that acts on it, but whether the agent as primary agent in the context of a particular change is changed by *producing* a change. I aim to show that in Aristotle's analysis of action and passion in *Physics* III 3, the agent as well as the patient is changed.

There is an assumption upon which Aristotle's argument is based. The action of the agent must be simultaneous with the passion of the patient. In *Phys.* II 3. 195 b17 ff., Aristotle tells us that that particular thing which is actually bringing about an effect is simultaneous with that which is being affected. For instance, the particular person who is doctoring is doctoring

at the same time as the particular person is being healed, and the particular person who is building is building at the same time as the particular thing is being built. This condition restricts the range of actions that Aristotle is considering. The action described by "Sirhan's pulling of the trigger caused Kennedy to die" would be ruled out because Sirhan's pulling of the trigger occurred prior to Kennedy's dying. However, one could describe a different action which would meet Aristotle's condition of simultaneity. The statement "Sirhan's killing of Kennedy caused Kennedy to be assassinated" meets the requirement because the killing by Sirhan is simultaneous with the assassination of Kennedy. Aristotle's paradigm cases of action and passion are all of this kind: doctoring and being healed, building and being built, teaching and learning.

I shall first discuss the importance of Chapter Three in relation to Aristotle's definition of motion in *Phys.* III 1. Secondly, I shall argue for what I take to be the correct reading of *Phys.* III 3. Thirdly and finally, I shall show that the reading I have suggested does not conflict with *Phys.* V 4 and does not preclude the existence of an unmoved mover.

# I

*Phys.* III 3 rounds off Aristotle's discussion of the definition of motion which he presents in III 1. Chapter Three serves as a clarification of the earlier treatment, and the restatement of the definition at the end of the çhapter suggests what precisely the chapter was intended to clarify.

The definition as presented in III 1 reads as follows (201 a 10-11): "Motion is the *entelecheia* of that which is in potentiality *qua* such (ἢ τοιοῦτον)." The meaning of *"entelecheia"* remains a hotly debated issue.[2] In *Phys.* III 1 it has been taken to mean either "actualization" or "actuality". The evidence seems to me strongly to favor the "actuality" reading. The etymology of the term is uncertain, but it has usually been assumed that it derives from "τὸ ἐντελὲς ἔχον", "having perfection", which suggests a state rather than the process to a state.[3] The term is nowhere else in Aristotle used to mean "process", but always has the sense of "actuality" or "perfection". But more importantly, if Aristotle is defining motion in this passage, and this seems to be his project for he says at the beginning of the chapter "δεῖ μὴ λανθάνειν τί ἐστι κίνησις",[4] then on the "actualization" interpretation the definition is circular because a term which means "process" turns up in the definiens.

Aristotle often uses "ἐντελέχεια" and "ἐνέργεια" synonymously, and they are in fact used synonymously in passages concerned with the

definition of motion (e.g. at *Phys.* III 1. 201 b 8-13 and by the author of *Met.* K 9 at 1065 b 16). There are dangers in understanding "ἐνέργεια" as "process", not the least being that Aristotle explicitly distinguishes ἐνέργεια from κίνησις in *Met.* Θ 6. However, "ἐνέργεια" does seem to be an ambiguous term. It sometimes means "activity", instances of which would be seeing, thinking, or being happy, sometimes "actuality, the form of a thing",[5] and sometimes "actuality, the individual thing".[6] So one could argue that "ἐνέργεια" can also mean "actualization", but then the objection of circularity in the definition will again apply.

So I take it that "ἐντελέχεια" should be translated "actuality". But this leaves us with a further question. Should "ἐντελέχεια" here be taken to mean the form of something or the individual thing that has that form? The question is significant because if "actuality" here is used to signify an individual, then it looks as though Aristotle is interested in processes as individuals which can be referred to by singular terms and which can have properties. If "actuality" is used to signify the form of a thing, then it is likely that he is interested in motion only as it is predicated of something else. The definition does not itself give us an answer to this question. However, as will become clear from my discussion of *Phys.* III 3, it does seem that Aristotle thinks that processes can have properties. Moreover, the fact that he gives conditions for identifying and individuating changes in *Phys.* V 4 suggests that Aristotle conceives of processes as individuals which, although dependent for their identification on substances, are not totally reducible to them.

The sense of "ᾗ τοιοῦτον" has also been debated.[7] Later in the chapter Aristotle uses the expression "ᾗ κινητόν" (at 201 a 29) and "ᾗ δυνατόν" (at 201 b 5) for the same purpose. What is the function of these expressions in the definition? If I am right in my suggestion that "ἐντελέχεια" means "actuality or individual", then there is an obvious reason. For three *entelecheiai* play a role in any change: the subject which undergoes the change, e.g. the bricks; the product which will result from the change, e.g. the house; and the motion, e.g. the being built. So if this view is correct, then "ᾗ τοιοῦτον" is being used to indicate how the thing described as potential must be understood so that we get motion as the actuality rather than the materials or product.

The definition Aristotle has given is: "Motion is the actuality of that which is in potentiality *qua* such (or *qua* movable or *qua* potential)." We must first ask, what does Aristotle mean when he describes something as "that which is in potentiality"? To identify something as potential, one must identify it via the actuality or end, for this actuality determines what

the potentiality is a potentiality for. By calling something "potential", one is saying that the thing is not φ, but is the sort of thing which can become φ. So a potentiality is something which lacks some particular form φ, but is the sort of thing that can achieve that form.

We may now ask the further question, what does Aristotle mean by adding the additional phrase "*qua* such" or "*qua* potential"? Given that "being in potentiality" must be cashed out as "being potentially φ", the phrase "*qua* such" or "*qua* potential" signals that once we have identified something as potentially φ, i.e. as the privation of the resulting state, what we are interested in is not the actuality which is the resulting state, but rather the actuality of the potentiality *insofar as it is potential,* i.e. has not yet become φ.

Let us consider this actuality. There is something which corresponds to "matter", the subject x which is potentially φ. It is potential so long as it is such as to be φ, but is not φ. For instance, bronze is potentially a statue so long as it is such as to be a statue, but is not a statue. There is also something which corresponds to the "form" of the potentiality insofar as it is potential, namely an infinite series of predicates describing points on a range from not-φ to φ. The actuality in question is a combination of these two factors: the actuality is an actualizing, the process of x becoming φ.

The point of the phrase "ᾗ τοιοῦτον", then, seems to be to pick out under what description the subject, that which is in potentiality, is being considered so that we get motion as the actuality rather than the materials or product. Of the three alternatives, two are ruled out. The subject is not considered *qua* potentially a house because Aristotle excludes the actuality which is the product at 201 a 10-11: "The actuality of the buildable is either the act of building or the house, but when the house exists it is no longer buildable, but that which is buildable is being built." Nor is the subject considered *qua* what it is actually, for Aristotle excludes the actuality which is that which undergoes the change at 201 a 29: "Bronze is potentially a statue, but motion is not the actuality of bronze *qua* bronze; for the being of bronze and the being of something potential is not the same, since if they were the same absolutely and with respect to the account, then motion would be the actuality of bronze *qua* bronze." Instead the subject is considered *qua* potential, i.e. such as to be φ, but not yet φ. Motion is the actuality of something, say bronze, which is potentially a statue insofar as it is potential, that is, insofar as it is such as to be a statue, but is not yet a statue. Motion is the actualizing of that subject from not-statue to statue. So motion is the actualizing of a subject from not-φ to φ. And once the subject is informed by φ, it is no longer potentially, but is actually φ. The

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definition is not circular because no term denoting a process turns up in the definiens. However, the actuality which the definiens describes is a process.

The definition as stated in *Phys.* III 1 applies to the patient and not explicitly to the agent. However, the extension to the agent seems to be implicit in the definition because earlier in the chapter Aristotle has placed the agent and patient in the category of relative (200 b 28 ff.): "Among relatives we place the more and the less, and that which can act and that which can be acted upon, and generally that which can cause motion and that which is movable. For that which can cause motion can cause it with respect to that which is movable, and that which is movable is so by that which can move it."[8] Since the agent and patient are relatives, it would seem that motion is the relation between the agent and patient. Aristotle never discusses relations as such. His treatment of the category of πρός τι in *Categories* 7 and *Met.* Δ 15 is a discussion of things which stand in some relation, i.e. relatives. But if I am right about this paradigm case of motion, then Aristotle is in fact interested in the logic of relations. And if this suggestion is correct, then it is implicit in the definition of motion that motion is the actuality not only of that which is able to be changed, but also of that which is able to change it.

I shall argue that it is the task of Chapter Three to make this extension of the definition explicit. The claim would seem to be justified by the conclusion of Chapter Three where Aristotle restates the definition in terms of both the agent and patient. He says at 202 b 26-27: "To put it more clearly, [motion is the actuality] of that which is potentially active and of that which is potentially passive *qua* such." But to see if the claim is true, we must turn to the text.

## II

So let us look now at the text of Chapter Three. The chapter breaks into four sections. In 202 a 13-21 Aristotle states his thesis that there is one *entelecheia*[9] of both the mover and the moved. In 202 a 21-36 he presents a difficulty which he resolves by *reductio*. In 202 a 36 - b 22 he returns to his positive thesis and, after raising and resolving a further difficulty, he sets out his own position in more detail. Finally, in 202 b 23-29 he summarizes the chapter taking into account the conclusions that have just been established.

He begins as follows (202 a 13 ff.): "What was puzzling us is clear, that the motion is in that which is moved; for it is the *entelecheia* of this by the mover. And the *energeia* of the mover is not different; for it is necessary

that the *entelecheia* is of both; and that which is capable of causing motion is in potentiality, and it moves by acting, but it is able to act with respect to that which is movable, so that the *energeia* of both is one, just as the interval between one and two and two and one is the same, and the upward and the downward [by which Aristotle seems to mean that there is something, e.g. a road that goes up and a road that goes down]. These are one, but the account is not one; so it is likewise with respect to the mover and the moved."

How are the terms "ἐντελέχεια" and "ἐνέργεια" being used in this passage? I have already suggested that in *Phys.* III 1 the terms have the same sense, viz. "actuality" taken to stand for the individual. But someone might say that the meanings of *"entelecheia"* and *"energeia"* (in its substantive form) should be distinguished here; that, for instance, *"energeia"* has the special sense of "activity" discussed by Aristotle in *Met.* Θ 6. But this will not do because Aristotle says at 202 a 14 that the motion is the *entelecheia* of the moved by the mover, and that the *energeia* of the mover is not different. And he goes on to say that the *energeia* of both (the mover and moved) is one, which is the point he is making at 202 a 15-16 when he says that it is necessary that the *entelecheia* is of both (mover and moved). Clearly the *energeia* of the mover and moved is not different from the *entelecheia* of both. Hence the two terms are synonymous.

But one could more seriously argue that "ἐντελέχεια" and "ἐνέργεια" mean the same thing, but what it is to be that *entelecheia* or *energeia* is different for the mover and for the moved. Motion, one might say, is the *entelecheia* of the moved by the mover, and something else, for instance *energeia* in its narrower sense of "activity", is the *entelecheia* of the mover. This is an attractive suggestion because Aristotle's argument in Chapter Three proves that the *entelecheia* of the agent and patient is one, but in the argument Aristotle does not explicitly claim that motion is the *entelecheia* of both. To use Aristotle's paradigm case of ποίησις and πάθησις in Chapter Three, teaching and learning, the claim would be that the *entelecheia* of the teacher and learner is the same, but what it is to be that *entelecheia* for the teacher is an activity, namely a teaching of the teacher in the learner, and a change in the learner, namely a learning of the learner by the teacher. If this is the case, then the agent is not altered when he acts. Only the patient changes.

Will this do? Had Aristotle spoken of the action of the teacher as a "πρᾶξις", the answer would be more clearcut, because in *Met.* Θ 6 Aristotle claims that activities are πράξεις, but changes are not πράξεις, or at any rate not complete πράξεις. In *Phys.* III 3 Aristotle does not speak of teaching as

a "πρᾶξις", but as a "ποίησις". But this choice of words does not in itself tell us very much. We may perhaps discount the use of "ποιεῖν" to characterize the function of that in virtue of which an agent can act, such as an art, because in *Phys.* III 3 Aristotle does not speak of the art as cause, but of the artist. Still, it is not clear whether the ποίησις of an agent is a change or an activity. Although Aristotle sometimes distinguishes ποιεῖν and πράττειν on the grounds that a ποίησις has an end separate from itself whereas a πρᾶξις is an end in itself,[10] which suggests that a ποίησις meets the conditions for being a change, it is not obvious that ποιεῖν can be so easily disentangled from πράττειν. There are cases in which "ποιεῖν" is used with the sense of "act" rather than "produce".[11] And although in *Met.* Θ 6 Aristotle tells us that building is a change, and building is a standard example of a ποίησις, in *De An.* II 5 he classes building with thinking, which is a paradigm activity. This suggests that the term "ποίησις" can refer either to a change or to an activity depending upon the context in which the term is used.

Let us look more closely at how Aristotle distinguishes a change from an activity. He gives the criteria to be satisfied by changes and activities in *Met.* Θ 6 and *E.N.* X 3-4. A change, he says, is not an end (*Met.* Θ 6.1048 b 18, b 22) and does not contain its own end (b 20-21), but is directed toward an end (b 19), and it has a limit (b 18). A change occurs in time (*E.N.* X 4.1174 a 19) and is complete only when it does what it aims at (a 20), i.e. it is complete only in the whole time or in the final moment (a 21). A change has parts which are not only incomplete, but also differ in form from the whole and from each other (a 21-23). The form of a motion is determined by its end-points (πόθεν ποῖ) (a 31-34; b 4-5). Since a change is complete only when the end is reached, one cannot say at the same time that something is X-ing and has X-ed (*Met.* Θ 6.1048 b 30-33): "is X-ing" applies to the subject only before the end is reached, "has X-ed" only after. Further, one would say that that which is changing is different when it is X-ing and when it has X-ed (b 32-33).[12] Because there is an end to be achieved and a change takes time, the end can be achieved quickly or slowly (*E.N.* X 3.1173 a 31 - b 4).

An activity, by contrast, is an end or is that in which the end is present (*Met.* Θ 6.1048 b 22-23). An activity does not have a limit, or at any rate does not need to stop at some time (b 26-27). It is complete at any time (*E.N.* X 4.1174 a 14-15), for it lacks nothing which coming into being later will complete its form (a 15-16), i.e. its form is complete at any time (b 5-6). An activity is whole in a "now" (b 9). Since an activity is an end in itself and is complete at any time, one can say at the same time that something is X-ing and has X-ed. And one would say that that which is X-ing and that

which has X-ed is the same (*Met.* Θ 6.1048 b 33-4).[13] And because there is no end apart from the action and the action is whole in a "now", an activity cannot occur quickly or slowly (*E.N.* X 3.1173 a 31 - b 4).

Given these conditions, when will building count as a change and when as an activity? Surely it must be a change when the builder has an aim separate from his action, i.e. when there is a product that the builder aims to produce. The action will be complete only once the product is finished. The act of building has parts different in form from the whole and from each other. In *E.N.* X 4 Aristotle clarifies this general point with the example of building a temple. At 1174 a 21 ff. he says: "All motions are incomplete in their parts and in the time they occupy, and the partial motions are different in form from the whole and from each other. For the putting together of the stones is different from the fluting of the column, and these are both different from the making of the temple; and the making of the temple is complete (for it lacks nothing in view of the end proposed), but the making of the foundation and of the triglyph is incomplete; for each is the making of a part. These differ in form, and it is not possible to find at any and every time a motion which is complete in form, but if at all, in the whole time." The act of building also has a form, a track, the end-points of which could be described as "is not building a φ" and "has built a φ". Also, the aim can be achieved quickly or slowly. Building thus meets the conditions for being a change.

Since building seems always to have an aim separate from itself, can it ever count as an activity? The answer must surely be yes. If we look not at any particular act of building which must have an aim separate from that act, but at the person who has learned how to build and is exercising his capacity, his act of building will be an activity, like flute-playing. Here we are not concerned with the end separate from the act, but only with the act which, because it is the manifestation of a capacity, is an end in itself. So one would say in this case that the builder is not altered when he builds.

In which way is "ποίησις" used in *Phys.* III 3? The temptation is to say that since the entire chapter is concerned with one thing bringing about a change in another, the action is a change completed only once the change is completed in the patient. Thus the teacher has taught the student φ, say the multiplication tables, only once the student has learned φ. In the *reductio* argument at 202 a 21-26, Aristotle assumes that ποίησις is a change and that it has an end (ποίημα). But this argument can be taken seriously in two ways. On either view, Aristotle is arguing that there cannot be two changes, but must be one *energeia*. On one view, which I shall consider in more detail later, one would say that Aristotle admits that both ποίησις and

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πάθησις are changes, but argues that they are not *different* changes. There is one motion which is the *energeia* of both the agent and patient. But on the other view, which I have been considering, the point of the argument is to show that although there is one *energeia* of both the agent and patient, what it is to be that *energeia* is a change for the patient and an activity for the agent. On this view Aristotle proves that ποίησις cannot be a change. There is one change which is in the patient.

Let us consider this. If the learning of the student is a change, then one cannot say at the same time that the student is learning and has learned. For this condition to be true, the verb must imply a terminus, and it must be the same terminus which is the goal of the progressive tense and the achievement of the perfect. Otherwise one could say at the same time that the student is learning φ now and has learned φ previously. Teaching, on this view, is an activity. One can say at the same time that the teacher is teaching and has taught; the teaching is an end in itself, so it is complete as soon as it starts. But can one say that the teacher has taught when the student has not yet learned? (Teachers may find it reassuring to think they have taught when they exercise their art before a sea of blank faces, but there is the inclination to call this wishful thinking.) Teaching, like learning, implies a terminus. To say that the teacher has taught when the student has not yet learned is like saying that *a* has killed *b* when *a* has only shot the gun. Surely *a* has not killed *b* until *b* dies, which may be hours or days after the shooting takes place.[14] Of course teaching can be an activity, just as building can be, in which case it is an end in itself. But Aristotle is here talking about one thing *bringing about* a change in another. That bringing about is not complete until the change in the patient is accomplished. As Aristotle says in *Met.* Θ 8.1050 a 17-19: "Teachers think that they have achieved their goal when they exhibit the student performing." So teaching, and in general ποίησις, as it is used in *Phys.* III 3, is a change.

This conclusion is justified by Aristotle's statement toward the end of Chapter Three. He says (202 b 19 ff.): "In general we would not say that teaching is the same as learning or that in the strict sense doing is the same as suffering, but [they are the same] in virtue of that to which both of these belong, namely the *motion*; for we would say that the *energeia* of this in that and the *energeia* of this by that differs in account." If Aristotle had intended that motion is the *entelecheia* or *energeia* only of the moved, he should have said: ". . . [teaching and learning and doing and suffering are the same] in virtue of that to which both of these belong, namely the *entelecheia*." The account which distinguishes the *entelecheia* of the moved from that of the mover is not an account of the *entelecheia* as a motion of

the moved and the *entelecheia* as something else of the mover, but rather the account of what it is for the *motion* to be the *entelecheia* of the moved and the account of what it is for the *motion* to be the *entelecheia* of the mover.

Both teaching and learning, and more generally, doing and suffering are motions. The point of Aristotle's claim at the beginning of Chapter Three, then, is that what he will show is that the correlative doing and suffering are not two different motions, but one. His thesis is that there is one *entelecheia* of both the mover and the moved.

In the opening passage of *Phys.* III 3, Aristotle compares the action of the mover and the passion of the moved to something, such as the road which goes up and the road which goes down. These, he says, are one, but the account is not one. The two descriptions "road up" and "road down" designate the same individual, the road. But the account of what it is for the road up to be the road is different from the account of what it is for the road down to be the road, for in the first case we describe all the turns and signposts between A and B, and in the second we describe all the turns and signposts between B and A. Similarly, the two descriptions "action" and "passion" designate the same individual, the motion, but the account of what it is for the action of the agent to be the motion is different from the account of what it is for the passion of the patient to be the motion. One account describes what the patient suffers; another describes what the agent does.

In the section that follows, Aristotle examines a difficulty which we have looked at briefly already. Many critics assume that the passage presents a purely sophistical objection which turns on the verbal difference between "ποίησις" and "πάθησις".[15] And so it would be if Aristotle has already assumed that the change applies only to the patient. But if, as I have argued, Aristotle believes that there is one change which involves both the patient and agent, then the charge that this is two motions is an objection that must be met. At 202 a 21 Aristotle assumes, contrary to the thesis above, that the *energeia* of the agent is different from that of the patient, and argues by *reductio* that this is impossible. He thus establishes his original thesis that there is one *energeia* of both the patient and agent.

He assumes that there are two motions, a doing (ποίησις) and a suffering (πάθησις). It follows from this that the function and end of each is different: of one the end is the thing done (ποίημα), of the other the end is the affection (πάθος). Since there are two motions, he asks: "If they are different, where are they located?" Either (1) they are both in that which is

acted upon and that which is moved, or (2) the action is in the mover and the passion is in the moved.

He considers the second alternative first. If the action is in the mover and the passion is in the moved, there will be a motion in the mover (for the same account will hold of the mover and of the moved, i.e. the motion of mover $a$ will be produced by mover $a'$), so that either (a) every mover will be moved, i.e. there will be an infinite series of movers, or (b) there will be something which has motion but is not moved. If we accept option (a), then an unmoved mover of any sort is impossible. If we accept option (b), then we are involved in a contradiction.

He then examines the first alternative ((1) above). At 202 a 31 ff. Aristotle says: "If both the action and the passion are in that which is moved and that which is acted upon, and both the teaching and the learning, which are two [motions], are in the learner, then first, the *energeia* of each thing will not be present in each thing; and secondly, it would be strange for two motions to occur at the same time in that which is moved, for how can there be two [simultaneous] alterations of one thing to one form? But this is impossible." It is of course not impossible for two generically different motions directed toward two different ends to occur simultaneously in the same thing: Jones can become dark at the same time that he is walking from A to B, and one motion will be incidental to the other.[16] What is impossible is for two active and passive motions of the same kind and directed toward the same end to occur simultaneously in the same thing. Jones cannot both learn φ and teach φ at the same time.

Aristotle concludes the *reductio* at 202 a 36 with an assertion of the original thesis: "But there will be one *energeia.*" He immediately raises a further objection. This time the charge is not that there will be two motions, but that, if there are not two motions, then there will be no difference between what happens to the patient and what happens to the agent. He says: "Nonetheless, is it not unreasonable for the *energeia* of two things to be one and the same in form? And they will be if the act of teaching is the same as the act of learning and action is the same as passion and if teaching is the same as learning and acting as being acted upon; so it would follow necessarily that the teacher learns all the things he teaches and the agent suffers all the things he does." It is worth noticing that if Aristotle has been assuming all along that the motion applies only to the patient, then the conclusion of this argument is as specious as the consequences arrived at in the *aporia* above. What we would expect on the standard view is the objection that if someone takes different descriptions of one motion to be synonymous with each other, then the result of this mistake is that the

learner teaches everything he learns. But Aristotle says that if one makes this mistake the teacher learns everything he teaches. So Aristotle is clearly concerned about what happens to the agent. The point of the objection is to show that one cannot infer from the fact that two descriptions designate the same thing (and here the same thing is a motion) that they are synonymous with each other. If one assumes that two descriptions of the same thing or motion must be synonymous with each other, then trouble will arise equally when one attempts to describe the motion of the patient and of the agent. Or to put the point in the language of relations, if one assumes that the relation R′, the converse of relation R, is symmetrical with R, then it follows that $R(x,y) \equiv R'(x,y)$, e.g. $a$ teaches $b \equiv a$ is taught by $b$. But it is not the case that the two relations are logically equivalent. Teaching and being taught (or learning) are asymmetrical relations. Only if we permute the terms in the converse relation can we obtain a logical equivalence: $R(x,y) \equiv R'(y,x)$, e.g. $a$ teaches $b \equiv b$ is taught by $a$.

In the rest of the section, Aristotle explains the difference between descriptions that are synonymous and descriptions that are not synonymous but which designate the same thing. At 202 b 5 he says: "It is not unreasonable for the *energeia* of one thing to be in another (for the act of teaching is the *energeia* of the teacher, in something certainly, and not in separation, but of something in something), nor does anything prevent there being one identical *energeia* of two things (not as the same in *being* (τῷ εἶναι), but as that which is in potentiality is to that which is acting)." Aristotle is saying that two *energeiai* are the same in being if the two descriptions of those *energeiai* are synonymous with each other, that is to say, if the same account can be given of what it is for those two descriptions to apply to the object. Two *energeiai* are the same but the being of those *energeiai* is not the same if the descriptions of those *energeiai* designate the same thing but are not synonymous with each other, that is to say, if the account of what it is for those two descriptions to apply to the object is different. One could say, for instance, that the patient potentially has the form that the agent already possesses: the two descriptions "potentially φ" and "actually φ" designate the same form, φ, but it does not follow that "φ" is synonymous in its two applications, for the account of what it is for "φ" to be applied to the patient is different from the account of what it is for "φ" to be applied to the agent. On one account it obtains potentially, on the other it obtains actually.

Aristotle continues: "So it is not necessary for the teacher to learn even though the action and passion are the same, for they are not one in virtue of the account that characterizes what it is to be that action and passion, as for

instance a mantle and cloak are one, but as the road from Thebes to Athens is the same as the road from Athens to Thebes, as we suggested earlier. For all the same properties need not belong to those things that are the same in some way, but only to those things of which the being is the same. It certainly does not follow that if teaching is the same as learning, then to teach is the same as to learn, just as it does not follow that if there is an interval between two points A and B, then the vector AB and the vector BA are one and the same. In general, we do not say that in the strict sense teaching is the same as learning or that doing is the same as suffering, but [they are the same] in virtue of that to which these belong, namely the motion. For to be the *energeia* of this in that and to be the *energeia* of this by that is different in account."

Aristotle's point is this: synonyms like "mantle" and "cloak" must refer to *energeiai* (things), which, under those descriptions, have all the same properties. "Teaching" and "learning", which are not synonymous, refer to *energeiai* (motions) which are the same in some sense, but they are not the same in the strict sense because, under those descriptions, the *energeiai* referred to do not have all the same properties. Thus the description "teaching" refers to teaching and "learning" refers to learning, and teaching is the same as learning; but under the description "teaching", the motion has different properties from those it has under the description "learning", for a property of teaching is that it belongs to the teacher and a property of learning is that it belongs to the learner. So the account of what it is for the teaching to be the motion is different from the account of what it is for the learning to be the motion: teaching is the motion of the teacher in the learner; learning is the motion of the learner by the teacher. So although teaching is the same as learning in that they belong to the same thing, the motion, the teacher does not learn everything he teaches because what it is to be the teaching is different from what it is to be the learning.

In the final section of Chapter Three, Aristotle states that he has now explained what motion is in general and what it is with respect to its components, and he claims that it is easy to show how it may be defined for each of its species, e.g. alteration is the actuality of that which is alterable *qua* alterable. He then repeats the definition of motion in expanded form (202 b 26 ff.): "To put it more clearly, [alteration or building or healing is the actuality] of that which is potentially active and of that which is potentially passive *qua* such."

In *Phys.* III 3 Aristotle has proved that there is a single *entelecheia* of both the agent and the patient. I have argued that motion is the *entelecheia* of both. If this is correct, then both the agent and patient are involved in the motion. And if both are involved in the motion, then both the agent and patient are changed in a single motion. The last step follows in accordance with Aristotle's conditions for an action to count as a change, namely the predicates "is X-ing" and "has X-ed" do not apply to the subject at the same time. This is a sufficient condition for saying that once "has X-ed" applies to the subject, the subject *is changed.* Among the conditions for being a change, Aristotle also says that the subject is *different* during and after the change, which makes the claim stronger, but since this condition depends on a debatable reading of *Met.* Θ 6.1048 b 32-33,[17] I shall not press this further point. The weaker condition is sufficient to prove that if the action of the agent counts as a change, which it does if I am right in my reading of *Phys.* III 3, then the agent is changed.[18] And since the patient is changed, and the motion of the agent and patient is not different, then both the agent and patient are changed in a single motion.

Two objections can be raised. First, it could be argued that this interpretation conflicts with one of the conditions for the identity of a motion which Aristotle presents in *Phys.* V 4. In that chapter Aristotle claims that there are three necessary conditions: first, the generic and specific identity of the track along which the subject is moved, for instance, from not knowing grammar to knowing it; secondly, the continuity of the time during which the subject carries out the journey; and thirdly, the numerical identity of the subject that is moved. The problem is the third condition. On the interpretation of *Phys.* III 3 that I have suggested, there are two subjects and not one. It would seem to follow, therefore, that if both the agent and patient are changed, then there are two motions. But this need not be the conclusion.

In *Phys.* V 4 Aristotle is concerned only with descriptions of motions which involve one singular term, e.g. "Coriscus is walking" or "Socrates is becoming pale". So according to the third condition, for two descriptions, e.g. "*a* is X-ing" and "*b* is Y-ing" to signify the same change, "*a*" must signify the same thing as "*b*". In the case of changes that involve an agent and patient, there are two grammatically singular terms, e.g. "Jones is building a house" or "Jones is teaching Smith". To satisfy the third condition stipulated in *Phys.* V 4, for two descriptions, e.g. "*a* is X-ing *c*" and "*b* is Y-ing *d*" to designate the same change, "*a*" must signify the same thing as

"*b*". That is to say, two descriptions pick out the same change only if their subject-terms signify the same individual. The identity of *c* and *d* will, on this description of the change in terms of the agent, be captured by the first condition, namely the specific identity of the track. So "*a* is X-ing *c*" and "*b* is Y-ing *d*" will designate the same motion only if "is X-ing *c*" and "is Y-ing *d*" designate the same track (whose end-points may be designated as "is not X-ing *c*" (or "is not Y-ing *d*") and "has X-ed *c*" (or "has Y-ed *d*")).

Since the designations of the motion involve two singular terms, we can give a different description of the motion. We can say "*c* is being X-ed by *a*" or "*d* is being Y-ed by *b*", and these two descriptions are the same only if "*c*" signifies the same thing as "*d*" and if "is being X-ed by *a*" and "is being Y-ed by *b*" designate the same track.

The two descriptions "*a* is X-ing *b*" and "*b* is being X-ed by *a*" are not synonymous with each other, but they designate the same motion. They are not synonymous because the account of what it is for *a* to X *b* is different from the account of what it is for *b* to be X-ed by *a*. In the first case we describe what happens to the agent in relation to the patient; in the second case we describe what happens to the patient in relation to the agent. This account of descriptions of motions involving two singular terms does not conflict with the *Phys.* V 4 criterion which stipulates that when the description of the motion involves one singular term there is one subject. When the description of the motion involves two (or more) singular terms, there will be two (or more) subjects respectively.[19] A different description of the motion can be given with respect to each subject: each description will refer to one motion, but the descriptions will not be synonymous with each other because what it is to be that motion will be different for each of the subjects involved.

A second objection can be raised. If, as I have argued, the agent is changed by its involvement in the change which occurs in the patient, what room is left for a mover that is not moved? Aristotle produces no separate argument for an unmoved mover in *Phys.* III 3, but he does claim at 200 a 30 that if there is a separate motion in the agent and in the patient, then one of two impossible results will follow: either every mover will be moved or there will be something that has motion but is not moved. The second alternative is a contradiction. Aristotle clearly thinks the first alternative is false.

Aristotle presents his arguments for an unmoved mover in *Phys.* VIII 5. I shall merely summarize those arguments here since my point is only to show that to ascribe to the agent participation in the motion is not to deny the existence of an unmoved mover. In VIII 5 Aristotle presents a series of

arguments to avoid the consequence that there will be an infinite series of movers if everything that is moved is moved by something. He concludes that the first in the series must be either a self-mover or an unmoved mover. He then considers the problem of self-movers. In order to explain the motion of a self-mover, one must distinguish the self-mover into moving and moved components. Again there will be an infinite number of movers needed to explain the motion of the mover. So the series must end with an unmoved mover. He concludes at 258 a 1-2: "Therefore part of the whole will cause motion being itself unmoved, and part will be moved; for only thus is it possible for something to move itself."

In *De An.* III 10 Aristotle tells us that the unmoved component of the self-mover is the practical good.[20] In *G.C.* I 7 he tells us that the art is the first mover which moves without being moved.[21] It is beyond the scope of this paper to discuss the relation between the practical good and the art, whether they are different things which stand in some relation or the same thing under different descriptions, but it is clear, whether they are different or the same, that neither can *produce* a change, so neither is an agent. They are nonetheless explanatory conditions of the agent's action. The practical good and the art provide reasons for the fact that the agent produces a change and for the fact that the patient is changed. So the account I have given of the agent does not preclude the existence of an unmoved mover, but actually requires such a concept in the explanation of the agent's action. I have not discussed Aristotle's explanation of how the agent changes as my aim has been merely to argue that in *Phys.* III 3 Aristotle proves that the agent changes.

In this paper I have argued that since Aristotle claims that the *entelecheia* of the agent and patient is one and that doing and suffering are the same because they belong to the same thing, the motion, he is also committed to the claim that the *entelecheia* of the agent in virtue of its capacity to cause motion and of the patient in virtue of its capacity to suffer it, insofar as they are potential, is the motion. This is what Aristotle in fact claims when he restates the definition at the end of Chapter Three: "[Motion is the *entelecheia*] of that which is potentially active and of that which is potentially passive *qua* such." Further, since motion is the *entelecheia* of both the agent and patient, both are involved in the motion; and if both are involved in the motion, both are changed. The account of that motion is nonetheless different for the agent and for the patient because what it is for the agent to produce a change in the patient is different from what it is for the patient to be changed by the agent. This interpretation does not conflict with Aristotle's conditions for the identity of motions, which he presents in *Phys.*

V 4, because there he is concerned with descriptions of motions involving one singular term. Such motions must have a single subject. When the description of the motion involves two or more singular terms, there will be two or more subjects involved in the change. Different descriptions, which are not synonymous with each other, can be given of the motion as it pertains to each of the subjects involved. Nor does this interpretation exclude the existence of an unmoved mover. The unmoved mover is distinct from the agent as an explanation of the agent's action.

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[2] Among the ancient and medieval commentators, Themistius (*Phys.* 70,8) and Philoponus (*Phys.* 351,12) defended the "actualization" view and were criticized by Avicenna (*Sufficientia* II, Cap. 1) and Aquinas (*Phys.* III, Lec. 2) who objected that the process view involves a circularity in the definition. See A. Maier, *Zwischen Philosophie und Mechanik* (Rome, 1958), pp. 3-57, for a full discussion of the medieval debate. Among the modern commentators, the "actualization" view has been defended by W. D. Ross, *Aristotle's Physics* (Oxford, 1936), p. 536; J. L. Ackrill, "Aristotle's Distinction Between *Kinēsis* and *Energeia*" in *New Essays on Plato and Aristotle,* ed. R. Bambrough (London, 1965), esp. pp. 138-140; T. Penner, "Verbs and the Identity of Actions" in *Ryle,* ed. O. P. Wood and G. Pitcher (London, 1970), esp. pp. 427-433. The "actuality" view has been supported by L. A. Kosman, "Aristotle's Definition of Motion", *Phronesis* XIV (1969), pp. 40-62, and J. Hintikka, "Aristotle on Modality and Determinism", *Acta Philosophica Fennica* XXIX (1977), esp. pp. 59-77.
[3] See Ross, *Aristotle's Metaphysics* (Oxford, 1924), vol. II, p. 246; LSJ, p. 575: "ἐντελέχεια from ἐντελής, ἔχειν". But cf. George A. Blair, "The Meaning of 'Energeia' and 'Entelecheia' in Aristotle", *International Philosophical Quarterly* VII (1967), pp. 101-117 (esp. p. 110) who argues for the meaning "having an end within".
[4] τί ἐστι is the expression that Aristotle uses over and again when he is looking for definitions. In *Phys.* III 2 Aristotle says that we can see from the difficulty others have had that it is not easy to define (διορίσαι) (201 b 17) motion in any other way than the way suggested. At the end of *Phys.* III 3 he says that it is clear (from the fact that we have already stated τί ἐστι κίνησις) how each of its species will be defined (ὁρισθήσεται) (202 b 24).
[5] See e.g. *Met.* H 2. 1043 a 2 ff. for Aristotle's use of ἐνέργεια to mean "actuality or form".
[6] See e.g. *Met.* Θ 6. 1048 a 37 - 1048 b 9, where Aristotle clarifies his concepts of ἐνέργεια and δύναμις by means of a set of analogies. The last two analogies bring out most clearly his use of "ἐνέργεια" to mean "actuality or individual": ἐνέργεια and δύναμις are "as that which has been wrought up from the matter is to the matter, and as that which has been shaped is to the unshaped".
[7] See Themistius (*Phys.* 70,33-71,1-10) and Simplicius (*Phys.* 414,1-1); Ackrill *op. cit.* pp. 139-140; Ross, *Physics* p. 536; Kosman, *op. cit.* pp. 46-50; Penner, *loc. cit.;* Hintikka, *op cit.* pp. 60-63.

[8] Cf. *Met.* Δ 15. 1020 b 28-30; 1021 a 14-25.

[9] Since there are problems concerning Aristotle's use of "ἐντελέχεια" and "ἐνέργεια" in Chapter Three, I shall in what follows leave the terms untranslated and transcribe.

[10] See *E.N.* VI.2. 1139 b 1-4; VI 4. 1140 a 1-23; cf. *M.M.* 35. 1197 a 3-13.

[11] See e.g. *E.N.* V 9. 1136 b 31: ποιεῖ τὰ ἄδικα.

[12] This is the most natural way to take the Greek: οὐ γὰρ ἅμα βαδίζει καὶ βεβάδικεν, οὐδ' οἰκοδομεῖ καὶ ᾠκοδόμηκεν, οὐδὲ γίγνεται καὶ γέγονεν ἢ κινεῖται καὶ κεκίνηται, ἀλλ' ἕτερον [καὶ κινεῖ καὶ κεκίνηκεν]. ἑώρακε δὲ καὶ ὁρᾷ ἅμα τὸ αὐτό, καὶ νοεῖ καὶ νενόηκεν. See, for instance, Ross, *Aristotle's Metaphysics,* Vol. II, p. 254, who translates: "It is not the case that a thing at the same time is being moved and has been moved; that which has been moved is different from that which is being moved, and that which has moved from that which is moving.' ἕτερον is easily understood as the subject of κινεῖ καὶ κεκίνηκεν." Cf. H. Tredennick, *Aristotle's Metaphysics* (London, 1933) p. 449. Because this reading leads to the surprising result that the agent as well as the patient is different during and after the change (note Aristotle's use of both active and passive verbs in the text), the reading has been challenged by Penner, *op. cit.* pp. 455-456, who supplies grammatical complements. On his reading "ἕτερον" and "τὸ αὐτό" refer to the object or distance covered and not to the subject. He reads: "'For it is not the case that simultaneously one is walking [from A to B] and has walked [from A to B], is housebuilding and has housebuilt [ = has built a house], is coming-to-be [something] and has come-to-be [that same thing], is being moved and has been moved [the same distance]; rather it is a different [distance, AB, over which] one is moving and [AA' over which] one has moved [something]. Whereas one has seen and is seeing (is thinking and has thought) simultaneously the same thing." But as Penner admits, these grammatical complements are introduced "entirely without textual warrant", and they obscure the fact that Aristotle is using both active and passive verbs. A third alternative could be argued, namely that "ἕτερον" and "τὸ αὐτό" could refer not to the subject or object, but to the states of affairs described by the progressive and perfect tenses of the verbs. Thus "is building" and "has built" refer to different states of affairs, while "is seeing" and "has seen" refer to the same state of affairs. Now while this is certainly the point that Aristotle is making when he says that "is building" and "has built" do not apply to the subject at the same time, while "is seeing" and "has seen" do, and it nicely resolves the difficulty we meet on the first view, viz. that the agent is different when it is building and when it has built, this reading involves a shift in Aristotle's use of "ἅμα". On the proposed reading, Aristotle says at 1048 b 33: "But 'has seen' and 'is seeing' are the same *at the same time.*" A few lines earlier he used "ἅμα" to indicate how activity-predicates apply to the subject. For he says at 1048 b 25-27: "One is living well and has lived well at the same time, and one is happy and has been happy. Otherwise it would be necessary for it to be stopped at some time as when one is thinning, and now is not, but one is living and has lived." Thus "is living" and "has lived" apply to the subject at the same time because "is living" does not have to stop being true of the subject in order for "has lived" to apply. But "is thinning" must cease to be true in order for "has thinned" to be true, or as Aristotle says: "It is not the case that one is walking and has walked at the same time, or is building and has built, or is coming-to-be and has come-to-be, or is being moved and has been moved." Surely the subject is different, albeit (with the exception of generation) only accidentally so, at the two times that the predicates apply because one predicate excludes the other. But since "is seeing" and "has seen" entail each other, the same thing is seeing and has seen at the same time. I am inclined to accept the result that the subject, whether it refers to that which acts or that which is acted upon, is different

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during and after the change, though I realize that if one dislikes the implication that the agent as well as the patient changes, the third alternative reading is also possible.

[13] See Note 12.

[14] See Judith Jarvis Thomson, "The Time of the Killing", *Journal of Philosophy*, LXVIII, 1971, pp. 115-132.

[15] Ross, *Physics*, p. 540; cf. P. H. Wicksteed and F. M. Cornford, *Aristotle, The Physics* (London, 1929) p. 209.

[16] *Phys.* V 1. 224 b 18-20.

[17] See Note 12.

[18] John Cooper has pointed out to me that since κίνησις is the nominalization of both the passive κινεῖται and the active κινεῖ, we can say that κίνησις applies to the agent without admitting the result that the agent is changed. But if "is changing" and "has changed" cannot apply to the agent at the same time, it would still seem to follow that on the criteria for being a change, which Aristotle presents in *Met.* Θ 6, what the agent does counts as a change *of it* as well as of the patient.

[19] E.g. one could describe a change involving three singular terms: "John gives the book to Mary." There will be three non-synonymous descriptions of the same change, one describing the giver, one the object given, and one the recipient. The account of what it is for each of these descriptions to designate the motion will be different.

[20] *De An.* III 10. 433 b 15-16.

[21] *G.C.* I 7. 324 a 30 - b 4.