DISCUSSION ARTICLE I:

Quidquid Movetur ab Alio Movetur

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In this paper I would like to present some brief critical comments on the traditional principle that everything in motion is necessarily moved by something other than itself. I will not argue that this principle is false. In fact, I shall even suggest that in a sense there is no conceivable way in which it could be falsified. Nor shall I argue that in principle it is impossible to show that it is universally and necessarily true. Rather, I shall restrict myself to showing that the three Aristotelian proofs of this principle as summarized by Aquinas in *Summa contra Gentiles* I, 13, are inconclusive.

Contrary to what some readers might expect, my critical remarks will not be based upon claims of Newtonian or post-Newtonian physics. It has been argued that the principle under review conflicts with the principle of inertia and I shall make some remarks on this matter toward the end of my paper. However, my criticism of the traditional proofs has nothing to do with physics, old or new. It rests on conceptual analysis and common sense evidence.

Two additional introductory remarks would seem to be in place. First, my criticism does not concern the formal validity of the proofs in question. As J. Salamucha and others have shown,[1] these proofs quite easily can be formalized and thus be shown to be perfectly valid. Rather, my criticism concerns the *premises* on which these proofs rest.

Secondly, I would like to ward off an objection that some readers are likely to raise. This objection amounts to saying that my criticism rests on asking "external questions." The objections that I raise, it might be objected, are meaningful only if one does not take into account the whole of Aristotle's and Aquinas' system.

As far as I can tell, this objection could mean either of two things. First, it could mean that I did not take into account all the

[1] Jan Salamucha, *The New Scholasticism*, 32 (1958), 334-372; J. Bendiek, *Franziskanische Studien*, 38 (1956), 1-38, 296-321.

premises on which the proofs in question rest. To the extent that this is the case, this objection would certainly be valid.

Secondly, the objection could mean that I did not take into account all the premises on the grounds of which Aristotle and Aquinas *believed* that their proofs are conclusive. This objection would miss the point of my argument, for I am not interested here in the problem of what the reasons or motives were, which induced Aristotle and Aquinas to believe that their proofs were conclusive. I am solely interested in the question whether and to what extent these proofs *are* conclusive. To put it in more general terms: historical considerations are highly relevant for deciding what the claim or proof under review exactly amounts to; but they are totally irrelevant for deciding whether the claim in question is true, or the proof under consideration conclusive.

'Moves' and 'Is Moved'

It would seem appropriate to start out with a few remarks concerning the exact sense of the sentence '*Quidquid movetur ab alio movetur*', henceforth abbreviated 'Q'. It is well known that the expression '*movetur*' is ambiguous. To begin with, it can refer either to locomotion alone, or to accidental change in general which, besides locomotion, includes changes such as alteration, decrease, increase, etc. Instead of discussing this point, I would like to restrict myself to stating that in this paper I shall speak *only of locomotion.*

Another ambiguity should be discussed in more detail. '*Movetur*' may mean either 'moves' in the sense of 'is in motion', or 'is moved' in the sense of 'has its motion caused by'. In this respect, the second '*movetur*' in 'Q' poses no problem; it clearly means 'is moved' in the sense of 'has its motion caused by'. The first '*movetur*', on the contrary, may mean either 'is in motion' or 'is moved by [something]'. Accordingly, 'Q' may be translated in two ways:

1. 'Whatever is in motion is moved by another' and
2. 'Whatever is moved by something is moved by another'.

In order to clarify the difference between 1. and 2., and to simplify later analyses, I would like to express these two versions of 'Q' as follows:

1.0 'For all x, if x is in motion, then there is a y such that x is moved by y and x is not identical with y';
2.0 'For all x and y, if x is moved by y, y is not identical with x'.

The difference between these two versions of 'Q' might be described as follows. 1.0 infers the existence of a definite type of y from x's having a certain property, namely, local motion; 2.0 infers a definite relationship between x and y from another relationship between x and y. Assuming that 'x is moved by y' entails 'x is in motion', it is obvious that 1.0 entails but is not entailed by 2.0 (which also amounts to saying that to prove 1.0 is to prove 2.0 but not vice versa). This is due to the fact that 1. could be construed as the conjunction of 2. and another sentence, namely,

3. 'Whatever is in motion is moved by something',

and that 1.0 could be construed as the conjunction of 2.0 and another sentence, namely,

3.0 'For all x, if x is in motion, then there is a y such that x is moved by y'.

Even at the risk of belaboring the obvious, it might be well to point out that

a) 1.0 entails both 2.0 and 3.0, but is entailed neither by 2.0 (except in conjunction with 3.0), nor by 3.0 (except in conjunction with 2.0);
b) the denial of 1.0 entails the denial either of 2.0, or of 3.0, or of both; and the denial of either 2.0 and 3.0, and *a fortiori* of both, entails the denial of 1.0;
c) neither 2.0 nor its denial entails either 3.0 or its denial, and vice versa.

Finally, a terminological stipulation might be in place. Just as the Latin '*movetur*' may mean either 'is in motion' or 'is moved by [something]', the English 'moves' may mean either 'is in motion' or 'causes the motion [something]'. To avoid ambiguities, I will always use 'is in motion' instead of 'moves', even though occasionally this might sound awkward. Thus 'y moves' will always mean 'y moves x'.

Aristotle, *Physics* VII, 1

I would like to begin my discussion of the traditional proofs of 'Q' by analyzing the curious argument that Aristotle advances at

the beginning of the seventh book of the *Physics*.[2] Since I cannot possibly reproduce here the whole text in question, I have to ask the reader to check for himself whether and to what extent my analysis succeeds in doing justice to what Aristotle says.

The passage in question begins by stating 3.0: "Everything in motion is necessarily moved by something." It should be noticed, however, that this first sentence does not state what Aristotle intends to prove. In any case, it is obvious that Aristotle does not intend to prove 3.0, for he immediately adds that there are only two possibilities: if x is in motion, then it is moved either by a y identical with x, or by a y not identical with x. This is an exhaustive alternative only if one assumes 3.0, for if one does not assume it, there remains a third alternative, namely, that although x is in motion there is no y such that it moves x. The fact that Aristotle does not even as much as consider this last alternative indicates that he does not intend to prove 3.0 but rather, assuming that 3.0 is true, tries to prove 2.0 and thus 1.0.

Accordingly one will have to say one of two things. Either the first sentence states a premise of the proof, not the *probandum*; or else the first sentence is incomplete. Aquinas seems to believe the latter, for he writes that Aristotle *proponit . . . primo quod necesse est omne quod movetur ab aliquo alio moveri*, in spite of the fact that the Greek text only has *ὑπό τινος* and the translation used by Aquinas correctly translated '*ab aliquo*', not '*ab aliquo alio*'.

A further complication should also be noticed. What Aristotle purports to show is that 'x is moved by a y identical with x' is self-contradictory. Thereby, he believes himself to have shown that 1.0 is necessarily true. This, however, as we already pointed out, is the case only on the assumption that 3.0 is necessarily true. In fact, and this is what I wish to point out: to make Aristotle's argument work, 3.0 has to be assumed to be necessarily true *two consecutive times*. For not only does 2.0 not entail 1.0 except in connection with 3.0, but moreover the denial of 'x is moved by a y identical with x' is equivalent to 'x is moved by a y not identical with x' only on the assumption that 3.0 holds. What I mean is simply this. 'It is not the case that x is moved by a y identical with x' is equivalent to 'Either x is not moved or x is moved by a y not identical with x'. Now even though 'x is moved'

[2] 241b34 to 242a49, ed. Ross; *textus alter*, 241b24 to 242a15.

entails 'x is in motion', 'x is in motion' entails 'x is moved' only if 3.0 holds. Accordingly, 'It is not the case that x is moved by a y identical with x' is equivalent to 'Either x is not in motion, or x is in motion without there being any y that moves x, or else x is moved by a y not identical with x'. The first alternative is uninteresting, since it is assumed that x is in motion. But it is obvious that the second alternative cannot be excluded except by assuming 3.0. Therefore, 'That x be moved by a y identical with x, is self-contradictory' is equivalent to 2.0 only if one assumes 3.0. This means, however, that Aristotle has to assume 3.0 two consecutive times: not only can he not show that 1.0 is necessarily true without assuming 3.0; he cannot even show that his argument proves 2.0 without assuming 3.0.

Later we shall argue that if the argument in question were valid, it *could* be construed so as to prove 3.0. For the time being, however, we shall discuss this argument only to the extent to which it purports to show that 'x is moved by a y identical with x' is self-contradictory. The argument, as Aristotle advances it, rests on the following five premises, the first of which can be taken to be a quasi-definition of 'an x that moves itself' (as we shall see, this first premise is quite unnecessary, contrary to what for example Aquinas believed):

2.11 For all x, x moves itself if and only if x is in motion, 3.0 holds, and there is no y such that it both moves x and is not identical with x.

2.12 For all x, if x is in motion, there is an a such that a is a quantitative part of x.

2.13 For all a and x, if a is a quantitative part of x, a is not identical with x.

2.14 For all a and x, if a is a quantitative part of x and a ceases from its motion, x ceases from its motion.

2.15 For all x and y, if there is an x and a y such that x is not identical with y and upon y's cessation from its motion x ceases from its motion, then x is not moved by itself.

This being assumed, the proof is very simple. Suppose an x that moves itself. As x is moved and 'is moved' entails 'is in motion', x will be in motion. Therefore it will have quantitative parts (2.12) that are not identical with x (2.13) and upon whose cessation from motion x will cease from its motion (2.14). But this means that there is a y not identical with x upon whose cessation from motion x ceases from its motion. Therefore x is not moved by itself (2.15).

Thus if an x moves itself, it is not moved by itself. Since this is contradictory, no x is moved by itself.

Against this argument, Avicenna raised the following difficulty: as x is assumed to move itself and thus to be in motion, it cannot also be assumed that x's quantitative parts cease from their motion.[3] Aquinas answers this objection by correctly pointing out that the argument does not assume that x's quantitative parts cease from their motion. It only assumes that *if* a quantitative part of x should cease from its motion, x would also cease from its motion. And a conditional proposition may be true even though its antecedent is necessarily false. To use Aquinas' own example: the proposition 'If man were a donkey, he would not be a rational animal' is obviously true even though man in fact never is a donkey.[4]

One might of course press further and argue that a conditional proposition might be true even if its antecedent is false and *its consequent true*. Applied to our argument this would amount to saying that 2.14 may be necessarily true, even though occasionally a quantitative part of x does not cease from its motion while x does cease from its motion. However, although it certainly is possible that *some* of x's quantitative parts "run away," as it were, it is impossible that this happen to *all* of x's quantitative parts. For in that case, there literally would be nothing that ceases from its motion; the whole of x simply would continue to be in motion. To indicate this, one might wish to replace 2.14 by

2.141 For all x that are movable, there is at least one a such that a is a quantitative part of x and x ceases from its motion if and only if a ceases from its motion.

Thus it would seem that the argument under consideration is formally valid. If nevertheless it seems inconclusive, this must be due to the fact that at least one of its premises is either false or at least non-obvious in some strong sense of this term. 2.11 would seem to be a fair definition of 'an x that moves itself'. In addition, this premise is wholly unnecessary, for the argument under review proceeds only from the assumption that there is an x that moves itself, and makes no use whatsoever of the equivalence stated by 2.11, 2.12, 2.13, and 2.141 would seem to be fairly self-evident;

[3] *Sufficientia*, II, 1.
[4] *Sum. cont. Gent.*, I, 13.

as for 2.12, we might add that in the sixth book of the *Physics* Aristotle advances an elaborate proof that we cannot discuss here.[5]

Accordingly, considering the basic implausibility of the argument, there must be something wrong with 2.15. Aristotle puts it as follows: "That which is not moved by something does not necessarily cease from its motion if something else is at rest; rather, if something is at rest when something else ceases from its motion, the former must be moved by something."[6] In the *textus alter* the same passage runs as follows: "That which is moved by itself in no way ceases to be in motion if another thing in motion stands still. Therefore, when something ceases to be in motion if another stand still, it is necessary that the former be moved by another."[7] Notwithstanding the verbal difference, both texts seem to state the same, namely,

2.151 For all x and y, if x is moved by a y that is identical with x, then there is no y such that if y ceases from its motion, x ceases from its motion; for if the latter is the case, there a y such that it both moves x and is not identical with x.

Or, put in a simpler way:

2.152 For all x and y, if there is an x and a y such that x is not identical with y, and upon y's cessation from motion x ceases from its motion, then x is moved by y.

At first sight, 2.152 might seem considerably stronger than 2.15. For while the consequent of 2.15 read 'then x is not moved by itself', the consequent of 2.152 reads 'then x is moved by y'. However, if one assumes 3.0, as Aristotle does, 'x is not moved by itself' is equivalent to 'x is moved by a y that is not identical with x'. And it seems quite natural to assume that the y thus mentioned in the consequent of 2.15 is the same as the one mentioned in the antecedent. This leads one to assume 2.152. In any case, this would seem to be what Aristotle has in mind, at least in the *textus alter*, the translation of which Aquinas was commenting upon.

Now it is easy to see that 2.152 is far from self-evident. To begin with, as the expression 'upon' obviously does not connote a

[5] 234b10 ff.
[6] 241b32-35, Ross.
[7] 241b33 to 242a3.

temporal sequence, it would seem to be the case that x and y cease from their respective motion simultaneously. Accordingly, it would seem reasonable to replace 2.152 by

2.153 For all x and y, if there is an x and y such that x and y are not identical, and y ceases from its motion if and only if x ceases from its motion, then either x is moved by y or y is moved by x.

That this is not a far-fetched and illegitimate interpretation is suggested by Aristotle himself who at one point[8] states that to say that x moves itself is like saying that one of its parts moves the other part, while one is not sure which part moves which. Yet it is obvious that 2.153 makes the whole argument inconclusive. After all, the argument purports to show that if an x is moved by a y identical with x, it is moved by a y non-identical with x; and it purports to show this by arguing that at least x's quantitative parts, which are distinct from x, may be said to move x. Yet if it is possible to say that x moves its quantitative parts rather than the other way around, then one precisely has not succeeded in showing that there is a y that both moves x and is not identical with x.

One of the few authors who noticed this difficulty is Sylvester Ferrariensis in his commentary to the *Summa contra Gentiles*.[9] He considered it worth proving that the movement of a body depends upon the movement of its parts rather than the other way around. His argument might be summarized as follows: while parts depend upon the whole in the order of formal causality, the whole depends upon the parts in the order of material causality. But generation is of the order of material causality. Consequently, with respect to generation, the whole depends upon its parts, rather than the other way around.

It should be obvious that this argument is not overly convincing. First, it seems difficult to say exactly what it amounts to. Secondly, locomotion seems to have nothing in common with generation. Even if it were true that a body depends upon its parts with respect to its generation, this would in no way prove that it depends upon its parts with respect to locomotion, for the latter clearly is not generation—a fact even Sylvester ought to have known.

Apart from this, however, it is by no means obvious that even 2.153 is universally true. In his commentary, Aquinas says that Aristotle *accipit quasi per se notum* that whatever is moved by

[8] 241b39-44, Ross.

[9] *In Cont. Gent., I, 13*, ed. Leonina, vol. XIII, p. 34, n. IV.

itself does not cease from its motion if something else ceases to move.[10] But it is difficult to see why this should be *per se notum*. It is by no means impossible to conceive of two self-moving bodies between which there is no direct causal relationship whatsoever and which nevertheless always begin and cease to move simultaneously.

What seems to have happened here is that Aristotle, and after him Aquinas, mistook the simple entailment 'If y ceases from its motion, x ceases from its motion' for a *causal* relationship. It may of course be a causal relationship, but if one simply assumes that it is one, the whole argument threatens to become circular. In any case, one would overlook an important alternative, namely, that there might be a law stating that x's and y's motions are co-ordinated. With respect to moving bodies, such a law might be called "the law of the coordinate motion of a body and some of its quantitative parts."

We might add that this point is hopelessly obscured by Ross' English translation of the *Physics*. For Ross translates: "a thing must be moved by something if the fact of something else having ceased from its motion *causes* it to be at rest" (our italics). This indeed is self-evident, for if y's ceasing from its motion *causes* x to cease from its motion, and x is not identical with y, then of course x does not move itself but is moved by y. But it quite obviously cannot be assumed that y *causes* x to begin or to cease from its motion, for this is what has to be proved. And in fact, the Greek text has nothing corresponding to Ross' 'causes'; it only says that "when something is at rest if another ceases from its motion, it must be moved by something." And this, as we pointed out, is by no means *per se notum*.

Curiously enough, neither Aristotle nor Aquinas seem to have realized that if one assumes 2.12, 2.13, 2.14 (2.141) and 2.152, it is possible to prove both 2.0 and 3.0, and to prove them directly instead of by a *reductio ad absurdum*. For assume that x is in motion, irrespectively of whether 2.0 or 3.0 hold or do not hold, then x will have quantitative parts (2.12) that are not identical with x (2.13), and upon whose cessation from motion x will cease from its motion (2.14). But this means that for any x in motion there is a y such that y is not identical with x that moves x (2.152). Therefore, 1.0 and *a fortiori* 2.0 and 3.0, are universally and necessarily true.

[10] *In VII Phys.*, 1, ed Maggiòlo, 886.

Of course, as 2.152 is not self-evident and quite probably even false, this argument is as inconclusive as the previous one. Aquinas certainly is right when he argues that *non potest esse primum mobile cuius motus non dependeat a partibus*;[11] but it still remains to be proved that the dependence in question is a) a dependence of the whole upon its parts, *rather than* the other way around; and b) that the dependence is a *causal* one to begin with.

I do not see how these two points could conceivably be proved.

Aristotle, *Physics* VIII, 4

This argument is obviously very weak. We list it only because Aquinas considered it strong enough to mention it in connection with the *prima via*. Salamucha calls it an "empirical proof"; Aquinas himself describes it as an argument *per inductionem*. Basically, this argument amounts to classifying motion in terms of a series of divisions that are assumed to be *per sic et non* (and thus not empirical), and to showing that in none of the types of motion can one speak of a self-mover.

The argument proceeds as follows. Anything in motion is in motion either *per se* or *per accidens*. 'To be in motion *per accidens*' means 'to be in motion because something else is in motion', like a part of a moving body is in motion because the whole body moves. Thus nothing in motion *per accidens* moves itself. Anything in motion *per se* is either in violent or natural motion. If it is in violent motion, it is moved by something else. If its motion is natural, then either its nature causes it to be in motion in such a way that its nature may also cause it to cease from its motion, as in animals; or its nature causes it to be in motion in such a way that its nature cannot cause it to stop, as in falling bodies. In the latter case, things are moved by the elements of which they are composed; in the former case, they are moved by their souls.

As convincing as this argument may have sounded in Aristotle's time, today it obviously proves nothing at all. Its basic weakness lies in the analysis of things that are in motion by nature. In this connection, I would like to restrict myself to two remarks. First, the expression 'by nature' may of course be taken to mean that a thing's nature *causes* it to be in motion. This is obviously the

[11] *Ibid.*, 889.

sense of '*κινήσις παρὰ φύσιν*' in Aristotle. But it could as well be taken to mean that it simply *is* a thing's nature to be in motion, and in this case, to look for a cause of motion makes as little sense as to ask, say, "Why do animals have a soul?".

Secondly, the claim that animals have a soul, and generally, that things have a nature that explains there doing this or that, can only be proven by assuming 'Q' or some of its derivatives. For such a proof will have to be a causal proof and thus presuppose some version of the principle of causality. But if this is the case, then the argument in question is ultimately circular.

Aristotle, *Physics* VIII, 5

We now turn to the most famous proof of 'Q', which rests upon an analysis of motion in terms of the notions of potency and act. Again, and this time irrevocably, it should be noted that this argument proves only that 2.0 holds. It is not a proof of 3.0, and therefore proves 1.0 only if one assumes 3.0. It rests on the following assumptions:

2.21 For all x and f, x is in potency with respect to f, if and only if x is not in act with respect to f.

2.22 For all x, y, and f, if x is moved by y, x is in potency with respect to f.

2.23 For all x, y, and f, if y moves x, y is in act with respect to f.

This being assumed, the proof is of a most elegant simplicity. Assume an x that is moved by a y identical with x. x will be in potency with respect to f (2.22), and y in act with respect to f (2.23). Yet, since we assumed that y is identical with x, x will be both in potency and in act with respect to f, contrary to 2.21.

Assuming that 3.0 holds, this amounts to saying that if x is in motion, it has to be moved by a y that is not identical with x.

Again, this proof is quite obviously formally valid. If it is inconclusive, there must be something wrong with 2.21 through 2.23. There is no particular difficulty with respect to 2.21. One only has to assume that, whatever 'in potency' exactly means, it is equivalent to 'not in act', and, whatever 'in act' exactly means, it is equivalent to 'not in potency'. In this way, 2.21 becomes perfectly analytic.

No such a simple procedure permits one to decide whether 2.22 and 2.23 are true or false. To decide this, one has to try to under-

stand what these two assumptions mean. More precisely, the task before us is the following: What meaning can be attributed to 'is in potency with respect to f', and 'is in act with respect to f', such that, if the *same meaning* is attributed to these expressions in all three premises, each of these premises will be *universally true?*

I shall abbreviate 'to be in potency with respect to f' by 'P', and 'to be in act with respect to f' with 'A' and discuss what 'P' and 'A' could mean.

I. At first one might wish to suggest that P is to be moved, or to undergo motion, or to have one's motion caused, or to receive motion, or something of this kind, and that A is to move, to produce motion, to cause motion, to give motion, etc. Upon this interpretation, 2.22 and 2.23 will be analyticaly true, but 2.21 will state what the proof under review is supposed to prove, namely, that nothing at one and the same time and in the same respect can be both the mover and the thing moved. Accordingly, the proof will be circular.

II. 'P' means 'not to be in locomotion' and 'A' means 'to be in locomotion'. On this interpretation, 2.22 will be false ('..., if x is "locomoved" by y, then x is not in locomotion'), and 2.23 untenable for Aristotle, since by definition it would exclude an Unmoved Mover.

III. 'P' means 'to be capable to undergo locomotion', while 'A' means 'to be capable of producing locomotion'. On this interpretation, 2.21 will not be universally true. For example, the fact that a mule can be pushed ten feet does not entail that it could not have covered the same distance on its own.

IV. 'P' means 'to be capable of undergoing locomotion while not being able to produce it' and 'A' means 'to be capable of producing it'. On this interpretation, 2.22 will not be universally true. The fact that x is "locomoved" by y does not entail that x was not able to cover the same distance on its own.

V. One might wish to press further and argue that 'P' means 'to be capable of undergoing locomotion and to be unable to produce it *while undergoing it*'. In this case, however, one would assume what is to be proven, namely, that a thing moved cannot be the source of its own motion.

VI. 'P' means 'to be capable of reaching some point in space

while still not being there', and 'A' means 'to be there'. This interpretation deserves a slightly more detailed discussion, not because it is tenable, but rather because Thomists occasionally seem to feel that this is what Aristotle and Aquinas meant.

According to this interpretation, 'P' means 'to be at point p while being capable of being at point r', to be in locomotion is to pass from p to r, and 'A' means 'to be at r'. Now it certainly makes sense to say that there are cases in which y cannot cause x's becoming or being f unless it has the property f. A teacher cannot make his students acquire the knowledge of a subject unless he has mastered it himself. From the point of view of pre-scientific knowledge, a body cannot heat another body unless it is hot, etc. But it is obviously nonsense to want to apply this idea to locomotion. When I shoot an arrow, the target is certainly the last place I am supposed to be. More specifically, this interpretation amounts to saying that all movers are necessarily tractors, while it is obvious that many movers are pushers, throwers, launchers, etc.

Notice that my objection has nothing to do with a point often made, namely, that today we have some difficulty in understanding locomotion as "actualization," or as a passing from potency to act. My point is simply that even at Aristotle's time it must have been obvious that many movers are pushers, and that pushers are never at the point toward which they move something—the only known exception being a boomerang-shooter who missed his target.

VII. 'P' means 'to be determinable with respect to locomotion', and 'A' means 'to be determined with respect to locomotion'. To appreciate this interpretation, we must briefly discuss an ambiguity of the expression 'determinable'. This expression seems to be one of the few adjectives ending in '-able' which are sometimes entailed by, and at other times both exclude and are excluded by, the corresponding adjective ending with '-ed'.

Picture two members of a Philosophy Department who, in the absence of their Chairman, are sifting the applications of potential graduate students. At one point, one of them might say: "Joe is simply unacceptable," and the other might reply: "But our Chairman has already accepted him." Since Chairmen have the last say, Joe is acceptable, because accepted. A moment later the other might say "I just met Jim whom we filed as acceptable," and his colleague might reply: "Take him out of that file—the Chairman has already accepted him." Since Jim has already been

accepted, he can no longer belong to the group of students who are only acceptable.

Thus 'acceptable$_1$' is entailed by, but does not entail 'accepted'; 'acceptable$_2$' excludes and is excluded by 'accepted'. This latter sense of 'acceptable' may be somewhat unusual, but as our illustration indicates, the expression may occasionally be used in this sense. Likewise with 'determinable'. In one sense, it is entailed by 'determined'; in another sense, it excludes and is excluded by 'determined'.

Now if we assume 'determinable$_1$', 2.21 will be false; and if we assume 'determinable$_2$', 2.22 will be false. For if we assume 'determinable$_1$', 2.21 would state that everything that is determined is not determinable, in the sense of 'determinable' entailed by 'determined'. But if we assume 'determinable$_2$', 2.22 would state that if x is locomoved by y, it is determinable with respect to locomotion in the sense of 'determinable' which excludes 'determined'; and, since 'determined with respect to locomotion' can only mean 'locomoved, 2.22 would read: ". . ., if x is "locomoved" by y, x is "locomovable" by y in a sense that excludes its being "locomoved".

This whole point may sound somewhat sophistical. However, Aristotle's version of the argument in question precisely suffers from this ambiguity. For Aristotle states the proof as follows:

> It has been established that it is the movable that is moved [by something]; but this is potentially, not actually in motion — the potential is on its way to completion, for motion is an incomplete actuality of the movable. The mover, on the other hand, is in act, as it is something hot that produces heat and, generally speaking, it is always that which possesses the form that produces it. Consequently, the same thing would be both hot and not hot in the same respect. Similarly in all other cases where 'mover' is synonymous [with 'the thing moved'].[12]

If we take 'f' to stand for an expression such as 'heat', the three premises of this argument might be put as follows:

2.24 For all x and f, if x is f-ed [by y], x is f-able.
2.25 For all x and f, if x is f-able, x does not possess f.
2.26 For all x, y, and f, if x is f-ed by y, y possesses f.

Suppose, then, that x is f-ed by a y identical with x. In terms of

[12] 257b6-13.

2.26, x will possess f; in terms of 2.24 and 2.25, it will not possess f. As this is a contradiction, there is no x such that it is f-ed by a y identical with x.

The obvious difficulty with this argument is that it uses the expression f-ed in a very narrow sense, namely, it restricts its application to those cases where being f-ed consists in passing from non-f to f, and where, therefore, being f-ed excludes possessing f. This leads to two important restrictions. To begin with, the argument does not apply to those cases where 'being f-ed' means 'being induced to maintain f'. For instance, the expression 'x is heated by y' may mean that x was cold and y causes it to pass from a lower to a higher temperature. In this case 'x is heated' obviously excludes and is excluded by 'x possesses heat [to the degree which it will reach by being heated]'. But the same expression might also mean that x is hot and y maintains its heat. In this case 'x is heated' entails 'x possesses heat'.

To this one still might object that, after all, this second meaning of 'heated' does not refer to change, and that therefore what we have just said is not to the point. However, the above argument cannot also be applied to locomotion, for 'being moved' obviously entails 'being in motion'.

Let us now look at how the premises 2.24 through 2.26 would look if 'f' referred to locomotion. The point I wish to make here is this: although all the premises are true, the argument itself will be invalid, for 2.24 and 2.25 will be true only if 'f-able' is taken in two different senses. Whatever is moved is obviously movable, and there is an obvious sense in which that which is movable is not in motion. However, it is impossible that 'movable' have the same meaning in both cases, for otherwise we would be permitted to conclude that if x is moved, x is not in motion, which is obviously false. To be more precise, the moved is movable in the sense of 'movable' which is entailed by 'moved' ('movable$_1$'); and the 'movable' is not in motion in the sense of 'movable' that excludes and is excluded by both 'in motion' and 'moved' ('movable$_2$').

Aquinas seems to have noticed this difficulty. In any case, he explicitly states in his commentary that since motion itself is some act of the movable, there is a sense in which the movable too is in act, and not only that which has completed its motion. Accordingly, he rephrases the argument as follows:

Motion is an imperfect act, for it is the act of that which is still in potency. On the other hand, that which moves is already in act, for nothing is reduced from potency to act except by something that is in act . . . Therefore, if something *in toto* moved itself, it would follow that one and the same thing would be in both potency and act. But this is impossible.[13]

If we restrict ourselves to locomotion, this argument can mean either of two things:

a) The act is the *terminus ad quem* of the locomotion in question that is, a point in space. Upon this interpretation, the argument is valid but leads to the difficulty which we mentioned in paragraph VI. This difficulty could be put as follows: either the argument *assumes that all movers* are at the point in space towards which they locally move something, and then the argument is based on an assumption that is quite obviously false. Or else the argument applies *only to those cases in which the mover is at the point in space* towards which it moves something, and in this case, 2.0 has not been proven.

b) The act is locomotion itself. On this interpretation, the imperfect act is the passage from the state of rest to the state of motion. While the mover is in motion, the thing moved is "on its way" to motion. With this interpretation there are two difficulties. First, it would seem to lead to an *infinite regress: if there is a motion that leads from rest to* motion, there will also be a motion that leads from rest to the motion that leads from rest to motion, etc. Secondly, if this interpretation is assumed, the argument in question demonstrates only a quite specific case of 2.0, namely, the case in which 'x is moved by y' is taken to mean 'y causes x to pass from rest to motion'.

This last point, however, raises an issue that is worth discussing briefly. One might want to argue that many if not all of the difficulties that we have hitherto encountered are due to the fact that we did not distinguish between two meanings of 'is moved'. For it would seem that 'is moved' can mean both 'was at rest and is set in motion', or 'is in motion and is being moved'. For example, a

[13] *In VIII Phys.*, 10, ed. Maggiòlo, 1053.

locomotive sets the wagons in motion, and from that moment onward keeps them in motion.

Now one might want to argue that all the interpretations which we rejected on the grounds that they entailed that when x is moved, x is a rest (or, alternatively, as in the last case discussed, that when x is moved, x is still not in motion), might become acceptable if one assumed the first of the two meanings of 'is moved'. It seems to me, however, that this suggestion cannot possibly suffice. For even if one takes 'is moved' to mean 'was at rest and is set in motion', it remains true that 'is moved' entails 'is in motion'.

The suggestion in question amounts to saying that something might be said to be moved, even though it is still not in motion. But this is clearly incompatible with any conceivable meaning of 'is moved', vernacular or not. Imagine a locomotive whose wheels have begun to turn, but which does not make any headway because the rails are oily. It might make some sense to say that the locomotive is trying hard but does not succeed. It might even conceivably make sense to say that the locomotive exerts its power of moving and the like. But it clearly makes no sense whatsoever to say that the wagons are being moved, even though they are not in motion.

Thus there is no significant difference between the two meanings of 'is moved'. In both cases, 'is moved' entails 'is in motion', and it makes no difference how long ago the thing said to be moved was at rest.

To sum up this involved discussion, we might say that with respect to locomotion there does not seem to be any possible interpretation of 'in potency' and 'in act' that would make the argument under review conclusive. This becomes most obvious when one considers Aquinas' tightest version of this argument in the *Summa contra Gentiles*, I, 13:

> Nihil idem est simul actu et potentia respectu eiusdem. Sed omne quod movetur inquantum huiusmodi est in potentia, quia motus est actus existentis in potentia secundum quod huiusmodi; omne autem quod movet est in actu inquantum huiusmodi quia nihil agit nisi secundum quod est in actu. Ergo nihil est respectu eiusdem motus movens and motum.

We could disregard the obvious difficulty, apparently overlooked by Aquinas, that if 'motus' refers to locomotion, this account by

definition excludes an unmoved mover. What is still more important is the fact that there seems to be no way of showing that the potentiality entailed by the very notion of locomotion (actuality of a potential as such) is contradictorily opposed to the actuality entailed by the activity of moving locally. What seems to have happened here is that Aquinas, operating with a metaphysical principle at a highly abstract level, forgot to ask himself what this principle would mean if applied to the specific case of locomotion (which after all he had in mind). For even though it might be true that nothing can at the same time and in the same respect be both in potency and in act, it has not been shown that the potentiality and actuality involved in locomotion are opposed to each other in a contradictory fashion. Or, to put it in another way, it has not been shown that the actuality and potentiality in question is "in the same respect." To show this, it does not seem to be enough to say that both are of the order of locomotion.

2.0 and 3.0

It seems to me that the main reason why Aristotle, Aquinas, and many others devoted so much time to proving that nothing can be both mover and moved is that they did not clearly distinguish between 2.0 and 1.0, which again was due to the fact that the Greek κινεῖσθαι and the Latin '*movetur*' mean both 'is moved by' and 'is in motion'. In English, 2.0 would seem to be fairly self-evident simply on linguistic grounds. We do not use the expression 'is moved' except in those cases in which we either know that there is a distinct mover which is moving, or at least expect this to be the case. When birds fly, stags run, or men walk, we never say that they are moved.

Accordingly, it would be quite odd to see an English-speaking philosopher try to prove that when something is moved, it is moved by another—almost as odd as if he tried to prove that when something flies, it is not flown. That Aristotle and Aquinas did not feel this way is obviously due to the fact that their respective languages did not induce them to unpack the ambiguities of 'Q'. For 'Q' obviously is not self-evident on linguistic grounds, for the simple reason that it is a conjunction of 2.0 and 3.0, and 3.0 is not analytic, either conceptually or linguistically.

In any case, it is obvious that it is 3.0 rather than 2.0 that calls for proof. To assume 3.0 and elaborately prove 2.0 amounts to

assuming the non-obvious and belaboring the obvious. But how could 3.0 be proven?

It should be obvious that in this case it cannot suffice to appeal to the general principle that any passage from potency to act presupposes a corresponding act. To begin with, it is far from obvious that locomotion *has* to be interpreted in terms of act and potency. It obviously *can* be interpreted in this way; but there is little evidence that it *should* be. For Aristotle, who thought in terms of natural places, it was rather plausible to view motion as something that had a natural completion. For us, physical space has become something through and through homogeneous; in the perspective of locomotion it simply makes little sense to say that things are more fulfilled and complete if they are at one place rather than another. This does not of course make it impossible to discuss locomotion in terms of act and potency and, more specifically, in terms of the traditional definition of motion as the actuality of the potential taken as such. However, as there is no "natural end" to locomotion, 'act' and 'potency' become *radically* relative terms, a fact that significantly reduces their theoretical usefulness.

Secondly, and more pertinently, the axiom that nothing passes from potency to act unless something in act induces it to do so is itself only a generalization of principles such as 3.0. Therefore, to prove 3.0 by such an axiom is comparable to "proving" the speed of the fall of a particular body in terms of the general law of falling bodies. The difficulty consists here in the fact that a law such as that of falling bodies always could hypothetically be falsified by the fall of a particular body, and that therefore it is ultimately the particular instance that proves or rather verifies the law, not vice versa.

On the other hand, however, there would seem to be no conceivable way of falsifying 3.0, and for that matter, 1.0 as well. As the traditional understanding of 1.0 does not require that the mover be empirically detectable, it is in principle always possible, in the absence of an empirical mover, to claim that there must be a transempirical mover, be it an angel or God. In view of this fact, some might want to argue that 3.0, and consequently also 1.0, are semantically meaningless. But it will be obvious to anyone who is not a rigid positivist that this is a great oversimplification. It would seem much more appropriate to say that 3.0, and consequently also 1.0, are basic assumptions of the Aristotelian-Thomist system—assumptions which from within the system have to be

regarded as synthetic *a priori* propositions, that is, propositions that are known to be universally and necessarily true even though on logical grounds their denial cannot be shown to be self-contradictory. This leads one of course to require some account of how we come to know 3.0 and 1.0, as well as their necessity and universality; the traditional answer would seem to be a theory such as that concerning the discovery of first principles at the end of the *Posterior Analytics* or, alternatively, the Thomist idea of the *lumen intellectus agentis* in abstraction.

In conclusion, I would like to mention briefly an issue that is often discussed in connection with 'Q'. It is well known that 'Q' was traditionally understood as applying both to the beginning and to the continuation of motion. What is less often noticed is that Aquinas' *prima via* quite explicitly presupposes that 'Q' does not apply only to the beginning of the motion, that is, to those cases in which a body in the state of rest passes into a state of motion. In any case, Aquinas' claim that he can demonstrate the existence of an Unmoved Mover without assuming that motion had a beginning in time is based upon the assumption that *motion itself*, not only the passage from rest to motion, requires a mover if it is to be explained.

To be more exact, there are the following alternatives:

a. 'Q' holds with respect to any motion during each moment of its occurrence. In this case, it makes no difference whether a motion is eternal or whether at some time in the past it was preceded by rest.

b. 'Q' holds only with respect to those periods during which a body passes from the state of rest to the state of motion or, more generally, when a change occurs with respect to locomotion. In this case,

   α. if the motion is eternal and uniform, no mover is required;

   β. if the motion was preceded by rest, a mover is required for its emergence but not for its continuation;

   γ. if the motion is not uniform, a mover is required for each period during which a motion of the character ψ passed into a motion of the character ϕ (where 'ψ' and 'ϕ' may refer either to speed, or to direction, or both).

As Aquinas believed it was possible to demonstrate the existence of an Unmoved Mover even though he did not believe it possible to demonstrate that motion began (that is, was preceded by rest), he clearly understood 'Q' in the sense of alternative a. Now it is

often claimed that alternative a. has been ruled out by Newton's First Law, which states that "every body continues in its state . . . of uniform motion in a straight line, unless it is compelled to change that state by forces impressed upon it." It is argued that this law entails that the continuation of a uniform motion in a straight line requires no explanation and thus does not permit one to say that there is a mover involved.

It seems to me, however, that this argument is based on a misunderstanding. First of all, Newton's First Law does not claim that there ever existed a body in uniform motion in a straight line. One might want to argue that this kind of motion is an abstraction to which nothing in reality ever corresponds; and this would amount to saying that in spite of Newton's First Law, each motion at any time of its occurrence requires some explanation. Of course, if the law holds, it is not motion as such that has to be explained, but its deviations from uniformity (of which the beginning is but a limit case) in a straight line.

Secondly, and more to the point, Newton's Law in no way excludes a mover even for those bodies that are in uniform motion in a straight line. More precisely, it only excludes a mover whose cessation from motion would entail that the body it was moving cease from motion as well, but not vice versa. It does not exclude a mover that moves a body if and only if this body is in uniform motion in a straight line.

Of course the existence of such a mover would have to be shown on grounds other than those of Newtonian mechanics. This could be done in either of two ways: by showing that 'Q' is analytic, or by showing that 'Q' is a synthetic *a priori* propositon. Yet it is difficult to see how anything of the kind could be shown. Since 3.0 does not seem to be analytic in any obvious sense of the term, it seems impossible to show that 'Q' is analytic. And it is very difficult to see how it *ever* could be shown that a proposition is synthetic *a priori*. It seems possible to prove propositions of the kind 'If 'p' is true, it is synthetic *a priori*'. But the difficulty is precisely that synthetic *a priori* propositions cannot be shown to be true either on logical or an empirical grounds and that therefore one has to appeal either to "insights" or to established bodies of knowledge—an appeal it is always easy to question.

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COMMENT:

Quidquid Movetur ab Alio Movetur: A Reply

by James A. Weisheipl, O.P.

Professor Lobkowicz is not interested in the historical significance of the Aristotelian principle that served as a basis for so much of St. Thomas' thought and of medieval science in general. He assumes historical considerations to be totally irrelevant for deciding the truth of the proposition. I, on the other hand, consider historical investigations to be essential for an evaluation of the universal validity of the principle. In my study, "The Principal *Omne quod movetur ab alio movetur* in Medieval Physics,"[1] I have shown that contemporary historians of science have presented an exclusively Averroist interpretation of the principle to the detriment of the Thomistic and the objectively valid position. In the Middle Ages there were many interpretations of the principle, as anyone can see from reading Averroes, Thomas Aquinas and Duns Scotus carefully. However, Lobkowicz contends that "the three Aristotelian proofs of this principle as summarized by Aquinas in *Summa contra Gentiles,* I, 13, are inconclusive" on strictly analytic grounds.

The first fundamental difficulty lies with the English translation of the phase. Lobkowicz follows the rendition of Hardie and Gaye along with many others that "Everything that is in motion must be moved by something."[2] "Απον τὸ κινούμενον is thus translated as "Whatever is in motion" (axioms 1.0, 3.0 and their consequences), "Everything in motion", "If a thing is in motion", *Omne in motu* or possibly *Omne movens.* In this case the Greek middle voice κινούμενον is translated by the active "in motion" instead of the Latin passive voice, *movetur.* In this rendering the principle means that everything that is now moving must be moved by something here and now conjoined to or in contact with the moving body. Such a statement is not at all obvious, as Aristotle well knew, and it is not a correct translation

[1] *Isis,* 56 (1965), 26-45.
[2] See *ibid.,* pp. 30-31.

of the plain Latin passive *movetur*. It is simply bad grammar and bad philosophy. I agree that Lobkowicz' translation is consonant with Averroes' view, but it is totally inconsonant with the views of Aristotle and St. Thomas. For Aristotle the "real difficulty" (μάλιστα ἀπορεῖται, *Phys.*, 254b29-30) is in determining the mover in movements that are not violent or self-moving, i. e., in natural motions such as the free fall of heavy bodies. It is not at all obvious that such motions are produced by another. It must first be shown that they are in fact κινούμενα, *moventur* in some sense; this Aristotle does at length in *Physics*, VIII, 4. St. Thomas is explicit in insisting that things that move naturally have within themselves an innate power (*inditam virtutem*), which is the source of movement. *Unde non oportet quod ab alio impellente moveatur.*[3] In other words, for St. Thomas there is no special mover, no *aliud impellens*, to explain natural motions here and now in existence other than the nature and the generator of that nature.[4] I do not speak of the *removens prohibens*, because that is only a *causa per accidens* for Aristotle and all the scholastics. Thus Lobkowicz' analysis of 1.0 and 3.0 cannot be taken seriously, except in an Averroist context.

Further, I fail to see any logical or ontological difference between axioms 1.0 and 3.0; the only difference I can see is a grammatical one. It makes no difference whether one says ὑπό τινός or ὑπ' ἄλλου, *ab aliquo* or *ab alio* or even *ab aliquo alio*. Aristotle himself frequently uses these ablatives of agent interchangeably (see, for example, 256a14-19). Every *aliud* is an *aliquid*, and the *aliquid* implicitly has to be an *aliud*. There is no particular significance or ignorance in St. Thomas' use of *ab aliquo alio*, since the aliquid is simply an indefinite adjective modifying *aliud*. Although this is much ado about nothing, Lobkowicz' distinction can be assumed for the sake of argument.

Furthermore, Lobkowicz wishes to understand the principle solely in terms of locomotion. This is unfortunate, particularly as we are given examples of trains and the like that are examples of violent motion. The Aristotelian principle as used by St. Thomas is intended to include every kind of movement, even generation,

[3] St. Thomas, *In III De Caelo*, 7, n. 9.

[4] St. Thomas, *In II Phys.*, 1, n. 4; *In I De Caelo*, 18, n. 1; II, 2, n. 6; III, 7, nn. 5-9; *In II Phys.*, 5, n. 5; IV, 12, n. 9; VIII, 8, nn. 5-7; *Sum. cont. Gent.*, III, 82, 84; *De Pot.*, V, 5.

and also intellection and volition. In *Summa contra Gentiles*, I, 13, St. Thomas gives the locomotion of the sun as an example. In St. Thomas' view this is clearly an example of 2.0 where the sun here and now requires the activity of a separated substance to keep it in motion.[5] Nevertheless, since locomotion is one kind of motion, the principle must be verifiable in this case, even though there are many problems.

In *Summa contra Gentiles*, I, 13, St. Thomas says that Aristotle proves (*probat*) the proposition *Omne motum movetur ab alio* in three ways. The first way is taken from *Physics*, VII, 1, and presupposes three points of clarification: (i) whatever moves itself has within itself a principle of that motion; otherwise it does not move itself, but is moved by another, Q. E. D. (ii) The proposition in question must be understood of a whole that is immediately (*primo et per se*) moved, and not a whole that moves itself by parts, such as an animal does. Natural things are moved *primo* and *per se*; spiritual things move themselves *primo* and *per se*. We are talking about the possibility of a physical body moving itself as a whole. (iii) This body has to be divisible, since everything moveable by physical motion has been proved to be divisible (*Phys.*, VI, 4; 10).

With these suppositions in mind the argument goes as follows: Whatever moves itself immediately, moves itself as a whole. Therefore when one divisible part is at rest, the whole is at rest. If one divisible part were at rest while the other is moving, the body would not be moving itself immediately as a whole (*primo* and *per se*), but by parts. In this case, the moving part would be the mover, as in the case of animals, and the body would not be moving itself immediately as a whole. Further, if one part came to rest because another part came to rest, it would follow that the movement of one part was caused by the movement of the other part. Again it would follow that the body did not move itself immediately (*primo* and *per se*) as a whole. In either case, whatever is moved is moved by another.

Against this one might argue, as Avicenna does (*Suff.*, II, 1), that if a body moves itself as a whole, no part can possibly be at rest; furthermore, parts can be said to be at rest or in motion only *per accidens*. Against this St. Thomas argues that the whole point

[5] See J. A. Weisheipl, "The Celestial Movers in Medieval Physics," *Thomist*, 24 (1961), 286-326.

of a self-mover is that it does not depend on anything for its motion, least of all on parts on which depend its motion and being. Moreover for the validity of the proof it is not necessary that a part actually be at rest. One need only assume the necessity of the consequence, 'If P, then Q'. Given the suppositions, it is true that if one divisible part were to be at rest, the whole would have to be at rest; otherwise it does not move itself *primo* and *per se*. This, however, does not prove that if a body is in motion it is moved. Bodies are in natural motion *primo* and *per se* by reason of their nature. But this does not mean that 'nature' (φύσις) is a self-mover or the mover in question.

Lobkowicz understands the Aristotelian source to be a statement of 3.0, by which Aristotle intends to prove 2.0 and thus 1.0. To this I would answer that the initial statement of *Physics*, VII, 1, declares 2.0 and that this is what he intends to prove in the subsequent passage from which St. Thomas gets his "proof." Since we are talking about bodies which move themselves *primo* and *per se*, we are talking about an x which is moved by y identical with it. If it is not identical, then it is moved *ab alio*, the point to be proved. There is no third alternative as claimed by Lobkowicz, for if there is no y that moves x, there is no question of *movetur* and the whole argument goes back to the x in motion. Further, it is not quite true to say that the statement "x is moved by a y identical with x" is "self-contradictory." Separated substances do in fact move themselves *primo* and *per se*. It is necessary to assume that we are here talking about physical bodies, which are divisible into quantitative parts. This was one of the presuppositions indicated. Furthermore, Aristotle by no means assumes 3.0 "twice" as Lobkowicz would have us believe; in fact Aristotle does not even once claim it as evident.

The second way Aristotle proves the proposition is taken from *Physics*, VIII, 4, already alluded to. It is by way of induction from all known motions to prove that everything that *is moved* is moved by another: (i) Whatever is moved *per accidens*, as a man in a ship, does not move itself, but is moved by reason of that in which is resides. (ii) Whatever is moved violently, as in projectile motion, is obviously moved by another, since this is the definition of violent motion (*Nic. Ethics*, III, 1, 1110b15; cf. 1110a2; *De Caelo*, II, 2, 301b18-19). (iii) Animate bodies in nature are clearly moved by the soul, the principle of self-motion

exercising its causality through the parts. (iv) The "greatest difficulty" (254b29-30) lies with inanimate bodies, such as light and heavy. Here St. Thomas simply says that they are moved by the generator (*per se*) and by the remover of an obstacle (*per accidens*). Therefore, in all known cases, whatever *is moved* is moved by another. This is clearly a proof of 2.0.

Lobkowicz says that this argument is obviously very weak and that it proves nothing at all. However, it is an exhaustive consideration and hence empirical, as Salamucha rightly notes. The fact that the list of motions can be classified as *sic et non* does not make it any less empirical, but only serves to show that it is exhaustive. Lobkowicz might have wished to include Newtonian rectilinear motion (first law) or Einsteinian relativity motions, but these would only go to confirm 2.0, even though these are only a mathematical way of considering motion.

Lobkowicz claims that the basic difficulty lies in an equivocal use of the expression 'by nature' as used of natural motions. For him it can mean *secundum naturam* or *est natura eius esse in motu*. Both of these meanings are quite wrong. He clearly does not understand the concept of *φύσις*.[6] Motions arising from nature do not arise from an efficient cause, but from a formal principle (*forma*) that is caused by the generator. Motions existing in the world can either be 'according to nature' (*secundum naturam*), 'beyond nature' (*praeter naturam*) or 'contrary to nature' (*contra naturam*). But in no case can it be a thing's nature to be in motion, for then motion would exist for its own sake. St. Thomas frequently insists "impossible est igitur quod natura intendat motum propter seipsum" (*Sum. cont. Gent.*, III, 23, § 6; also *De Pot.* V, 5). The simple reason lies in the very nature of motion, which because of its potential character is incapable of finalizing anything. Lobkowicz probably has in mind Newton's first law of motion, a completely unobservable situation. The problem for the mathematical physicist and the philosopher in this case is the *change* of velocity or direction, and these are admittedly ab aliquo. The possibility of a body in a constant state of inertial motion raises different problems for the mathematician and for the philosopher. For the mathematician it is simply a null factor or a re-

[6] J. A. Weisheipl, "The Concept of Nature," *New Scholasticism*, 28 (1954), 377-408.

sistance factor, and that is all that is needed for Newtonian physics. The natural philosopher wants to know much more. Further, the fact that 'things have a nature' is not a matter of proof for Aristotle, but a matter of simple understanding as expounded in *Physics*, II, 1. Since Lobkowicz misunderstands the meaning of φύσις, he is bound to misunderstand the implications. But even if the statement 'things have a nature' were proved by 'Q', such an argument would not be circular, for the notion of nature is prior to us (*quoad nos*), while the notions of potency and act are prior in themselves (*quoad naturam*).

The third way Aristotle proves the proposition is taken from *Physics*, VIII, 5. It is a *propter quid* demonstration giving the proper reason why nothing can move itself with respect to the same motion, that is, nothing can be simultaneously both mover and moved with respect to the same numerical motion. The reason lies in the very definition of 'mover' and 'moved.' A thing is not a mover unless it reduces the potentiality of the patient to actuality; there is no mover unless some *change* is effected in the patient. This is why Aristotle insists that there is only one reality, motion, which belongs in different ways to both agent and patient (*Phys.*, III, 3). It belongs to the agent as that 'by which' (*a quo*) motion is produced; motion cannot be produced except by an agent already in act, at least in respect to this particular motion. Motion belongs to the patient as that 'in which' (*in quo*) it resides; motion cannot reside in a patient that is not in potentiality for motion and for the term of motion. Precisely as agent it must be in act in order to produce a change in the patient. Precisely as patient it must be in potency. Since potency and act are contraries, nothing can be both agent and patient, mover and moved, with regard to the same motion. Therefore nothing moves *itself* with respect to the same numerical motion. "Et sic nihil movet seipsum." St. Thomas goes on to note that Plato said that all spiritual movers move themselves by thought and will. This is only a verbal difference, since Plato uses "motion' in a wider sense to include *motus perfecti*, while Aristotle restricts it to physical motions defined in the Physics as *motus imperfecti*.

Lobkowicz rightly notes that this analysis proves only 2.0. Aristotle and St. Thomas are not concerned with 1.0 or 3.0. But Lobkowicz states three immediate consequences of 2.0 and seven difficulties. The first consequence, 2.21, is not true: "x is in

potency with respect to f, if and only if x is not in act with respect to f." One cannot argue from 'not in act' to therefore 'is potency;' there may be no potency whatever for f. The second, 2.22, is ambiguous: "if x is moved by y, x is in potency with respect to f." This depends on whether one means simple or actualized potentiality, in which case it is false, or actualized potentiality, in which case one is simply arguing *ab esse ad posse valet illatio.* Lobkowicz seems to take 'potency' in the first sense only. The third, 2.23, is false as understood by Lobkowicz: "if y moves x, y is in act with respect to f." This all depends on what he means by f, a symbol never fully clarified by the author. Y need only be in act with regard to actualizing the patient x, but it need not be in act with regard to motion or to the term of motion, as in the case of the First Mover or the soul; it need only be in act with regard to the production of motion. This is also true of all analogical causes.

The seven difficulties raised by Lobkowicz concern insolubilia involving the consequences when understood in terms of potency and act. Only the sixth and seventh difficulties need concern us here. The sixth is supposed to be the current Thomistic interpretation: 'P' means 'to be capable of reaching some point in space while still not being there,' and 'A' means 'to be there.' No Thomist known to me would say that "y cannot cause x's becoming or being f unless it has the property f." Lobkowicz rightly points to the absurdity in the case of locomotion. Thomists say rather that y cannot cause x's becoming or being f unless it has the active power to produce f and motion toward f. The important thing about a mover is that it is capable of producing that motion and that it be in act with regard to that production; it does not mean that it has to possess f in act.

The seventh difficulty involves a precise understanding of potentiality in 'Q.' In the interpretation given, 'P' means 'to be determinable with respect to locomotion,' and 'A' means 'to be determined with respect to locomotion.' Lobkowicz' ambiguity is a simple one. It involves two meanings of the word "potency." In one sense it is used of potency *without* act precisely as such; in the other sense it is used of potency *under* act or already actualized. An actualized potentiality does not eliminate potency any more than prime matter actualized eliminates matter; all that is eliminated is the state of being deprived of an act—a privation. The

other use of the term potency is the state of being deprived precisely as such; it is the *absence* of actualization. In this privative sense there is no act, while in the actualized sense there is both potentiality and actuality. The insolubilia which follows this ambiguity (2.24 to 2.26) are solved by the proper distinctions.

Applying this ambiguity to locomotion, Lobkowicz sees many difficulties. First let me say that there are three, not two, senses of the word 'act' in 'Q'.

a) Act as the *terminus ad quem* of the mobile. Applied to locomotion this means a point in space as the term of motion. Now when this is applied to the mover in locomotion Lobkowicz sees only two possibilities, namely after *all* movers are at the *terminus ad quem*, in which case it is false, or it applies only to those movers which happen to be at the *terminus ad quem*, in which case 2.0 is not proved. In actual fact, no mover need be at the term of motion, but only capable of producing it.

b) Act as locomotion itself. Here Lobkowicz' difficulties involve two erroneous assumptions. He assumes that the mover itself must be in locomotion; this is obviously false when applied to the First Mover and to many natural motions. Further he assumes that the act produced is somehow not the act of both mover and moved. St. Thomas clearly and carefully explains how the single reality of motion is in a certain sense the act of both mover and moved (*In III Phys.*, lect. 4-5). A teacher is not teaching unless someone is taught; likewise nothing is a mover unless something is moved.

c) Act as the power of the mover. This is the meaning of "nihil agit nisi secundum quod est in actu" (*Sum. cont. Gent.*, I, 13, § 9; *Summa Theol.*, I, 2, 3, etc.). Here two senses of the word 'act' are implied: the active power (*potentia activa*) for producing the effect and the realization of this power in the moved. Wherever there is the realization of this power in the moved there is also the active capacity in the mover for producing it, but not vice versa.

With regard to the cause of natural locomotions in the universe there is great difficulty. There is no difficulty in the case of violent motion, whether one explains this in terms of [illegible] or *impetus*; in either case the cause of the motion is from without, *ab alio*. But in natural motions of heavy bodies downward and light bodies upward there is great difficulty, *ad hoc* [illegible], as

Aristotle noted. Natural locomotions arise spontaneously (*statim, subito, immediate*) from the nature of the body, its φύσις. This is the formal or active principle of motion (*principium formale et activum*).[7]

In corporibus vero gravibus et levibus est principium formale sui motus, quia sicut alia accidentia consequuntur formam substantialem, ita et locus, et per consequens moveri ad locum; non tamen ita quod forma naturalis sit motor, sed motor est generans, quod dat talem formam, ad quam talis motus consequitur.[8]

It is essential to note that this nature is not the 'mover,' the 'efficient cause' of such natural motions: "sed motor est generans, quod dat talem formam, ad quam talis motus consequitur." Commenting on the nature of this formal principle, St. Thomas notes:

Sed huiusmodi principium non potest dici potentia activa, ad quam pertinet motus iste. Omne enim quod movetur ab alio movetur. Neque aliquid movet seipsum nisi per partes, inquantum una pars eius movet aliam, ut probatur in 8 *Phys.* Natura igitur, secundum quod est principium motus in eo in quo est, non comprehenditur sub potentia activa, sed magis sub passiva. Gravitas enim in terra non est principium ut moveat, sed magis ut moveatur. Potentia igitur activa motus oportet quod sit in alio ab eo quod movetur, sicut aedificativa potestas non est in aedificato, sed magis in aedificante.[9]

If nature were conceived as a 'mover' in non-living things, there would be no way to distinguish living and non-living things of this universe. Aristotle himself was careful to point out the essential difference between living and non-living things, e.g., *Phys.*, VIII, 4; *De Anima*, I, 3 and 5, etc. The fundamental attribute of living things is that they move themselves, that is, they are the efficient cause of their characteristic motions, such as walking, flying, swimming, squirming, and so forth. Non-living things spontaneously manifest certain motions, such as downward and upward, in virtue of their nature, which is a formal principle of motion and rest in those things in which it exists *per se* and not as a concomitant attribute.[10] Thus while form is the active prin-

[7] St. Thomas, *De Pot.*, V, 5 and ad 12; *Sum. cont. Gent.*, III, 23; *In III De Caelo*, 7, nn. 5-9; *In VII Meta.*, 8, n. 1442.

[8] St. Thomas, *In II Phys.*, 1, n. 4.

[9] St. Thomas, *In V Meta.*, 14, n. 955; cf. *In VII Meta.*, 8, nn. 1440-1442.

[10] *Phys.*, II, 1, 192b21-3; III, 1, 200b12-13; VIII, 3, 253b5-6; 4, 254b14-

ciple from which spring natural motions, including local motions, it is not the mover or efficient cause of those motions. The true mover or efficient cause of these motions is the generator of the nature. This brings us back to substantial generation, the crux of the Aristotelian principle, *Omne quod movetur ab alio movetur.*

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17; *De Caelo*, I, 2, 268b16; III, 2, 301b17-18; *De Anima*, II, 1, 412b15-17; *De Gen. Animal.*, II, 1, 735a3-4; *Meta.*, VI, 1, 1025b20-21; IX, 8, 1049b4-10; XII, 3, 1070a7-8; *Nic. Ethics*, VI, 4, 1140a5-6; *Rhet.*, I, 10, 1369a35-b1.