

ARISTOTELIAN NOTION OF PRIME MATTER



William McCracken

I. Introduction

A. History

B. Statement of the method of attack

II. Getting down to a principle

A. Some possibilities

B. Number of being

C. Contraries

D. Complete separation impossible

III. Principles

A. Must be basic

B. Must be more than one

IV. Substratum

A. Substance is fundamental

B. One substance comes from another substance

C. Potentiality and actuality

D. Number of potentiality in a single substance

E. Matter needs form

F. Matter persists through change

G. What is the essential nature of matter

H. Ancients were mostly concerned with matter; Aristotle is mainly concerned with form

V. Summary

A. Potentia materiae

B. Appetitus materiae

C. Ingenerabilitas et Incorruptibilitas materiae

D. Unitas et differentia materiae

VI. Corollaries

A. Is prime matter good

B. Prime matter cannot exist by itself

VII. Conclusion

ARISTOTELIAN NOTION OF PRIME MATTER

Since the dawn of philosophical thought, one of the most perplexing questions which philosophers have almost universally considered is the problem of deciding of what the "stuff" of the universe around us consists. The earliest philosophical systems of course attributed the origin of the world to whatever deities they happen to believe in. But even these, for the most part, have also some more or less developed system of cosmology with an explanation for the things we see around us. These early systems more commonly held a dualistic explanation for this phenomena, usually body and spirit (1). This problem was always subjugated to the religion of the particular group and flowed from this religion until the time of Thales, who decided that the original element of the universe was water (2). After his time every philosopher of any consequence had to comment on this question and the theories which they expounded were no longer as intimately linked with their religion. The various theories or speculations as to what this original element of the universe was, after the time of Thales and until the time of Aristotle, seem to be as numerous as the eminent philosophers of the same period (3). The most prominent among the systems of this period were those of the atomists, who held that the universe consisted of an infinite number of indivisible bodies called atoms, or uncutables, which differed in shape, order, position and magnitude to account for the differences in physical things; the dynamists, who taught that the world was composed of unextended "force points," the Pythagoreans, who taught a rather mystic system of numbers for their cos-

mology; and Empedocles, who taught that the world consisted of four basic components: fire, air, earth, and water (4). Plato had three worlds. The one in which we live he called the world of "Phenomena" and had a rather negative idea regarding the composition of its "stuff" which he called *το μῆλον* (5). This was evidently due to the fact that he thought this world was only a shadow.

Aristotle was a disciple of Plato and corrected this idea. It is his notion which has been accepted by St. Thomas and the scholastics, and part of which this paper chooses to treat. It has come to be known by the term "hylomorphism."

"Hylomorphism is the theory which explains the constituent of 'natural bodies' by means of the dualistic composition of matter and form." (6)

This paper has no intention of dealing with the latter principle, but only the question of matter, and that from the Aristotelian viewpoint.

"The substance of bodies is entitatively diffused in space. This diffusion in space, or extension, is a static, passive, entitative principle which is its foundation source. And since that is 'material' which occupies space, this principle is the material principle; we call it matter." (7)

This matter may be distinguished further into two classes: prime matter and secondary matter. Prime matter is

"indeterminate, homogenous in all bodies, and the permanent subject of all profound changes effected in matter." (8)

Bittle defines it as

"an incomplete corporeal substance, undetermined but de-

terminable, capable of receiving any kind of substantial form." (9)

As Gredt says,

"Materia prima est pura potentia." (10)

That means that it possesses neither quantity, quality, nor specific essence. Secondary matter Gredt defines,

"Corpus seu substantia corporea completa, in aliqua determinata specie rerum constituta." (11)

In other words, secondary matter is what we are accustomed to meet in ordinary life. It is just everyday "stuff." We could never perceive prime matter as such, for by the definitions we see that it is completely indeterminate and therefore not ordinarily comprehensible by the senses. However, it is possible to come to it by deduction and that is what Aristotle did. It is the purpose of this paper to show how Aristotle did this and to show how some of the other deductions can follow from this. Secondary matter does not come in for consideration. Aristotle first proceeded to show that all the Greek philosophers before his time had been on the wrong track and then he himself started from scratch.

GETTING DOWN TO A PRINCIPLE

Some Possibilities---

"The possibilities in question must be either (a) one or (b) more than one.

"If (a) one, it must either (i) be motionless, as Parmenides and Melissus assert, or (ii) in motion as the physi-

cists hold, some declaring air to be the first principle, others water.

"If (b) more than one, then either (i) a finite or (ii) an infinite plurality. If (i) finite (but more than one), then either two or three or four or some other number. If (ii) infinite, then either as Democritus believed, one in kind, but differing in shape or form; or different in kind and even contrary..." (12)

Aristotle here enumerates the possibilities, and now proceeds to eliminate. He goes on to show that this question is really outside the realm of the physicist, and this eliminates all the possibilities.

"Now to investigate whether being is one and motionless, is not to contribute to the science of nature ... but is ... like arguing against any other position maintained for the sake of argument ... or like refuting a merely contentious argument ... accept one ridiculous proposition and the rest follows ... we physicists, on the other hand must take for granted that the things that exist by nature are, either all or some of them, in motion." (13)

Aristotle thus sets aside the notion that "being is one and motionless" (14) and begins with the supposition that being is in motion. It was necessary for him to do this to be consistent with his system of epistemology for there he builds on the premise that the senses are reliable -- a premise which he adequately proves there. That applies to their realm of activity only. Aristotle goes on to say that

"At the same time the holders of the theory of which we are speaking do incidentally raise physical questions ... it will be perhaps well to spend a few words on them." (15)

NUMBER OF BEING

How is being one? -- Aristotle begins by asking himself questions.

"In what way may it be asserted that all things are one? ... Do they mean that all things 'are' substance or qualities or quantities? And further, are all things one substance -- one man, one horse, or one soul; or quality, and, that one and the same -- white or hot or something of that sort?" (16)

The philosopher says that it is impossible to hold any of these doctrines and proceeds to prove his point. His proof is simple and follows along the same line as that of Plato for the angler. Aristotle uses this method quite extensively also. Aristotle rather uses more of the conditional or strictly hypothetical syllogism, thus eliminating one premise at a time. In this case it has to be either one of these things (substance, quantity, or quality), or all of them. If it is one of them, they must be able to exist independently. That they can none of them exist separately or independently, the philosopher proved in his previous work, the "Organon." (17) He therefore concludes that they must all exist together, and being must be both substance, and quantity, and quality. He then shows that they are not one in this sense at all but one in principle.

"Primo manifestat quomodo ponebant unum materiale principium." (18) In other words Aristotle shows that all things are one in the sense that they are one underlying material principle. It is the substratum, or what we are now accustomed to call 'Materia Prima.'

CONTRARIES

The Philosopher then goes on to examine some of the other theories, proceeding in the same way. He states that

"many physicists make the underlying body one ... -- then

generate everything else from this, and obtain multiplicity by rarification. Now these are contraries which may be generalized into 'excess and defect,' (Compare Plato's 'Great and Small' -- except that he makes these his matter, and the one his form, while others treat the one which underlies as matter and the contraries as differentiae, i.e. form)" (19)

The Philosopher here wishes to demonstrate how the substratum is one while the variations of this substratum are accounted for by a co-principle, which, for many other thinkers has assumed the nature of contraries. The notion here attributed to Plato of reversing the order of the principles and making the substratum the active principle or form, was comparatively recently revived by E. I. Watkin, who gives it a certain plausibility which causes one to stop and take notice, for it is not too impossible that it should be the 'materia prima' which is activating, while the 'forma substantialis' remains passive. (20) Where the idea of contraries comes into play also and more familiarly, is in placing the substratum of Aristotle, or the materia prima, on one side of the scale as the passive principle; and the substantial form on the other side as the active principle. St. Thomas does this (referring back to "primo" (21)

"Considerandum est autem circa primum, quod Philosophus in praecedentibus more disputantium visus est opponere ad utramque partem oppositam." (22)

COMPLETE SEPARATION IMPOSSIBLE

Aristotle agrees with Anaxagoras that complete separation of the two principles, or contraries, will never take place, but says that Anaxagoras does not fully comprehend the significance of that statement. To try to have one of these principles without the other is like trying to have quantity without quality. The contraries are

both really principles but both are incomplete in themselves. They are co-principles and one needs the other. Neither can exist by itself "in re." This means that the substratum can never exist by itself for it would have no notes by which it could be recognized, since notes belong to its co-principle.

PRINCIPLES

Must be basic:

"First principles must not be derived from one another nor from anything else, while everything must be derived from them. But these conditions are fulfilled by primary contraries." (23)

This follows logically that first principles cannot be derived from one another. To say that they could would be a "petitio principii," or, in other words, "idem per idem probatur." That everything else must be derived from them is evident if they are to remain first principles. Following the lead of Aristotle, we get the definition of a first principle,

"Principium est id, a quo aliquid habetur quocumque modo." (24)

Aristotle goes on to say that these conditions are fulfilled by primary contraries

"which are not derived from anything else because they are primary, nor from each other because they are contraries." (25)

Must be more than one -- Therefore, Aristotle formally draws the conclusion that since the requisites for these first principles can only be fulfilled by contraries, the principles must be more than one in number. The necessary requisites for contraries can only be fulfilled by two. However, he continues,

"it is plausible to suppose them to be more than two. For it is difficult to see how either density should be of such a

nature as to act in any way on rarity or rarity on density." (26)

St. Thomas has this to say on the point:

"Nam primo probavit, quod principia sunt contraria et nunc induxit rationes ad probandum quod contraria non sufficiunt ad hoc quod ex eis generentur. Et, quia rationes disputativae verum concludunt tantum secundum aliquid, sed non secundum totum; ex utrisque rationibus veritatem concludit; et dicit, quod si aliquis putet veram priorem rationem, quae probabat principia esse contraria, et bona immediate positam, quae probabat contraria principia non posse sufficere; ad salvandum utramque est necesse dicere, quod quoddam tertium subsit contrariis, sicut dixerunt ponentes totum universum esse naturam, materiam, sicut aquam aut ignem aut aerem, aut medium horum, ut vaporem aut aliquid huiusmodi et magis videtur de medio. Hoc enim tertio accipitur ut subjectum contrariis, et quomodo ut distinctum ab eis. Unde illud quod minus habet contrarietate, convenientius ponitur tertium principium praeter contraria." (27)

The idea conveyed is that something must bring the co-principles together or separate them as the case may be; otherwise the result would be static for they would be frozen in their primary state and would be incapable of change. That brings in the idea of "privation" and "substantial change." These are outside the scope of this paper and it is not necessary to treat them here. (28)

SUBSTRATUM

Aristotle thence proceeds to determine the nature of the passive principle. He is still in the same trend of thought.

"Only substances are said to come to be in the unqualified sense." (29)

By that he means that accidents, though they may come to be, are able to come to be only in so far as they come to be part of another substance. They cannot exist independently. They must always be part of another. By the unqualified sense, of course, he means that they come to be an independent being. Aristotle further proves this by the fact that substance alone cannot be predicated of another subject, but, on the contrary, everything else is

predicated of substance. All the accidents may be predicated of substance but substance can never be predicated of any accident. The division into substance and accidents is dichotomous. Therefore, the statement is valid.

The Philosopher asks the question:

"How can substances be derived from what are not substances? Or how can non-substance be prior to substance?" (30)

This, as he goes on to point out, would be metaphysically impossible for it would make non-substance prior to substance and that would be a denial of the principle of proportionate cause which goes back to the principle of contradiction. The conclusion can only be that one substance comes to be from another substance.

This is brought about by substantial change. (31) In general things which come to be, come to be in different ways, as Aristotle puts it,

"(1) by change of shape, as a statue; (2) by addition, as things that grow; (3) by taking away, as Hermes from the stone; (4) by putting together, as a house; (5) by alteration, as things which turn in respect of their material substance." (32)

"It is plain that these are all cases of coming to be from a substratum."

"Thus, clearly, from what has been said, whatever comes to be is always complex. There is on the one hand, (a) something which comes into existence, and again (b) something which becomes that." (33)

That may not seem very clear at the first glance but Nys must have been referring to this passage when he says:

"For a being to change, an essential part of it must persist throughout the change and be found unchanged in the final result. Were this not the case, change would resolve itself into the annihilation of one substance and the substitution of another by way of creation." (34)

The thing to which they refer as remaining the same is the pas-

sive principle or prime matter according to the scholastics. The part which changes is the determining principle of the physical body or the substantial form. The prime matter is the substratum from which Aristotle says things come to be. When he says that "whatever comes to be is complex" (35), he is referring to the twofold composition of the new body from matter and form. However, if we read further, we see that Aristotle goes through a long process of mental gymnastics to bring out his point. Simply, he arrives at hylomorphism thus: After he observes a series of substantial changes, he notes that there is always "something which comes into existence, and again, something which becomes that." (36) He also notes that both of these are complex. They are made up of something which changes and something which remains the same. The "something which comes into existence" (37) is the new substantial form, while the "something which becomes that" is the old body which is made up of matter and form, but which was deprived of its old form in the process of substantial change.

Aristotle also says that,

"Things can be explained in terms of potentiality and actuality." (38)

The Philosopher here refers to the fact that the substratum is the potential principle, for it is capable of becoming many things, or any one of many things, while the form is the active principle or actuality for it is that which actualizes or determines and makes a thing to be what it is. By passive principle is meant one which, although it has possibilities in itself, it is not capable, in itself, of realizing these possibilities but needs help from

another to realize them. Therefore, it is in itself an incomplete principle. Prime matter is such an incomplete principle. The active principle is also incomplete in itself for it, though it is what actualizes, it must have something to actualize or something on which to act. It needs the prime matter on which to act.

The question is next brought up:

"If the substratum is one numerically, it must have also only a single potentiality." (39)

Aristotle here refers to a mistake commonly made by the earlier philosophers, especially Parmenides. These two are really different things. A thing is one numerically when its essence is one. It is one being and only one being. It is that being and only that being. That does not mean that it has been a single potentiality for that would be a denial of substantial change. To say that a thing had a single potency would mean that it would be what it was and never be able to change or become anything else -- e.g. hydrogen would be hydrogen and nothing else for it would never be able to combine with oxygen and become water. This, as we know is not true. The error is plainly one of equivocation.

Aristotle then goes on to show that matter needs form. This is clear from what we have already said about the active and passive principles. Just as the active principle needs something to actuate, also the passive principle needs something to actuate it. The passive principle is the matter and the active principle is the form. Therefore, matter needs form. They are co-principles, and each is incomplete in itself.

But does matter persist through change? Aristotle says:

"The matter comes to be and ceases to be in one sense, while in another, it does not. As that which contains the privation, it ceases to be in its own nature, for what ceases to be -- the privation -- is contained within it. But as potentiality it does not cease to be in its own nature, but is necessarily outside the sphere of becoming and ceasing to be." (40)

That might be clearer in a paraphrase. Looking at matter from one viewpoint, it ceases to be in the process of substantial change, for it is deprived of the form which it is natural for it to have. But if it is viewed merely as potentiality, it is completely indeterminate homogeneous and permanent and therefore outside the realm of change in se. In this paper we are considering it according to the latter view as that is the way it is generally considered by the schoolmen. Aristotle later shows it by an analogy. He says that

"...if you planted a bed and the rotting wood acquired the power of sending up a shoot, it would not be a bed that would come up, but wood -- which shows that the arrangement...is merely an incidental attribute whereas the real nature is the other, which, further persists continuously through the process of making." (41)

That latter statement brings up another question. Is the essential nature the matter or the form? Referring to the above statement, the Philosopher says,

"This then is one account of 'nature', namely that it is the immediate material substratum of things which have in themselves a principle of motion or change.

"Another account is that 'nature' is the shape or form which is specified in the definition of the thing.

"For the word 'nature' is applied to what is according to nature and the natural in the same way as 'art' is applied to what is artistic or a work of art." (42)

In this second instance where Aristotle refers to nature as the form of a thing he goes through what amounts to this process.

First he takes the definition of nature which he has previously worked out and which is pretty much the same as the modern scholastic definition -- *natura est principium intrinsicum radicale operandi*. Then he applies it to the thing from different angles. The import of that last sentence is that, though the nature of a thing might be said to lie in the matter as is shown above (43) it is only by an equivocal use of the term nature. Then he turns to form with the conclusion that

"The form indeed is 'nature' rather than the matter; for a thing is more properly said to be what it is when it has attained to fulfillment than when it exists potentially." (44)

Philosophers before the time of Aristotle seem to have been chiefly concerned with matter, as he himself says.

"If we look at the ancients, physics would seem to be concerned with matter..."

"But it would be the part of physics also to know nature in both senses." (45)

From here on Aristotle is chiefly concerned with nature in the second sense -- form. By that fact he establishes physics, or the study of nature, on a new footing for that constitutes the bulk of his studies on nature. He goes to great length on the subject but that is out of place here. It is left for us to summarize and put it into cut and dried scholastic form. John of St. Thomas, has synthesized it thus:

"Ad quinque conditiones possunt revocari omnes conditiones materiae, scilicet Potentia, Appetitus, Ingenerabilitas, Unitas, Differentia unius materiae ab alia. Nam unio, quae videtur esse conditio materiae, non est propria ipsius, sed com-

munis etiam formae, nec tam pertinet ad ipsam materiam, quam ad eius applicationem ad componendam totum." (46)

Now let us look at each of the five individually.

Potentia Materiae -- Gredt solves any difficulty about the potentiality of prime matter very simply. He says,

"Materis prima est pura potentia." (47)

He goes on to define pura potentia lest there be any doubt as,

"pura potentia absolute, ita ut caret quocumque actu substantiali sive formali sive entitativo." (48)

John of St. Thomas, states it more clearly that prime matter is

"Pura potentia, non solum per exclusionem actus formalis, sed etiam actus entitativo. Ex quo sequitur, quod potentia materiae sit pure passive, et nullo modo activa: Tum quia caret omni actu primo, qui est forma, et consequenter omni activitate, activitas enim est actus primus, id est, virtus ad agendum: tum quia caret actu secundo ex se, qui est existentia, sine qua tamquam sine conditione nulla virtus activa operatur active, seu effective...potentia materiae est ad esse, non ad operari, sive illud esse quod recepit sit tantum esse formale, sive sit etiam esse entitativum...aliqua ex istis accidentibus dimanarent a materia, ad huc non supponitur in ea aliqua activitas et vis effective, quia dimanatio non est actio proprie loquendo, et formaliter, sed solum identice quatenus actio quae producit immediate substantiam, mediate attingit passionem...connexio ipsa passionis productae cum substantia." (49)

Appetitus materiae -- Appetitus est:

"Inclinatio rei et ordo ad aliquam rem, sibi convenientem." (50)

Appetite can be considered in two ways: innate appetite and elicited appetite. Innate appetite is an appetite rising from the very nature of a thing without the medium of cognition, e.g. a beam or a pole naturally tends to have a center of balance which might be called the center of ponderability. Elicited appetite follows cognition, e.g. a man desires food. This desire arises from our knowing this food and the benefits to be derived from our eating it, or the harm which will result if we do not eat. Since matter does

not have cognition, we are here considering the first type or innate appetite.

"Appetitus materiae est appetitus innatus, qui non distinguitur ab eius entitate. Constat hoc ex Philosopho primo Physicorum, text. XVIII, quem ibi declarat D. Thomas contra Avicennam, lectione XV. 'Nihil, inquit, est aliud materiam appetere formam, ideo inest ei semper appetitus formae, non propter fastidium formae quam habet, nec propter hoc quod quaerat contraria esse simul, sed quia est in potentia ad alias formas, dum unum habet actu.' Videri etiam potest prima pars, quae est. LIX, articulo secundo ubi inquit: 'Quod inclinatio quae est per aliquid superadditum essentiae, sed per materiam quae appetit esse, antiquam habeat, et per formam, quae tenet rem in esse, postquam fuerat.' (51)

Further as to the extent of this appetite of matter, in general two things may be said. First, as far as corruptible forms go, the appetite of prime matter extends to all of them simpliciter, but not in the same way. There are certain forms which a thing has not had and does not have but can only have, and it is around these that the appetite centers for it has a capacity and a potentiality to come to them, or attain them, through privation. In the second place,

"...materia appetit omnes formas sub unica ratione formali, et haec ratio in materia sublunari est, id in quo conveniunt omnes formae corruptibiles, scilicet esse substantiale, corruptibile, et generabile." (52)

In generabilitas et Incorruptibilitas materiae -- This can be considered negatively and positively. Negatively, it lacks the principles of generation. It does not have a subject from which it can become. If we exclude "creatio ex nihilo" and annihilation, we may say that generation is "transitus de esse ad non esse," while "corruptio est transitus de esse ad non esse." For a thing to

be it must have both matter and form for it must be able to have motion in some way to be a physical thing. Prime matter is something physical at least in nature or essence, but, since it is pure potentiality, it does not have any parts and cannot therefore in se undergo motion. Since motion presupposes parts, it rests actually in the whole being -- a composite of both matter and form, though primarily in form. It is therefore that Gredt says that,

"Motus, quo amittitur forma substantialis, dicitur corruptio; motus, quo acquiritur forma substantialis, dicitur generatio." (53)

Positively viewing it, it is readily apparent that prime matter has to be incorruptible and incapable of being generated, for if it were we would have annihilation and creation instead of substantial change.

"Unitas et differentia materiae." This, as can be readily seen, quickly boils down to the question of individuation and where it ultimately lies. This is one of the knottiest questions in all of philosophy. Briefly it is this which the Thomists, building on this Aristotelian foundation, say that the principle of individuation is "materia signata quantitate," (54) matter in some way sealed by quantity a full discussion of this would require a single paper much longer than this one. Gredt gives the Thomistic doctrine simply thus:

"Thesis XXII: Principium individuationis substantiarum corporeum est materia signata quantitate, i.e. materia conotans quantitatem interminatam...

"(per exclusionem) Principium individuationis substantiarum corporeum est aliquid substantiale, quod non supponit substantiam individuum, sed eam individuum constituit, et quidem ita, est multiplicetur in eadem specie, seu ita ut constituatur alia et alia, quin varietur species. Atqui sola materia signata quantitate est aliquid substantiale, quod non supponit substantiam individuum, sed eam individuum constituit, et quidem ita, est multiplicetur in eadem specie. Ergo." (55)

Corollaries:

I. Is prime matter good?

"Good has rightly been declared to be that at which all things aim." (56)

The good at which prime matter aims is actual being or secondary matter. It lacks this and therefore has imperfection. This difficulty is simply overcome thus:

"Quod vero materia dicitur esse bona, respondetur quod non dicitur bona formaliter, et in actu, sed secundum capacitatem et ordinem ad bonum. Unde dicit D. Thomas I part. Qu. V, artic. ad 3: 'Quod materia participat aliquid de bono scilicet ipsum ordinem vel aptitudinem ad bonum, et ideo non convenit sibi, quod sit appetibile, sed quod appetat:' et sic intelligitur in III contra gentiles citato, quod materia est bona ratione bonitatis actualis in se." (57)

II. Prime matter cannot exist by itself.

"materia prima est realiter distincta ab existentia neque dicit ordinem ad actum entitativum, ad existentiam, nisi mediante forma, ac proinde absolute repugnat materiam sine forma exsistere. Immo etiam forma ac proinde tota essentia physica est realiter distincta ab existentia. Non enim potest esse existentia identificata cum forma materiali, quia haec est incapax exsistendi, neque cum forma immateriali, quia etiam forma immaterialis, sicut omnis forma informans, essentialiter incompleta est, existentia autem semper est completa." (58)

As I have emphasized all the way through, prime matter is an incomplete principle in itself and this paper does not attempt to treat the co-principle -- substantial form. For that reason, the paper may seem incomplete. However, it has gone as far as it intended to go. It has been an attempt to show how Aristotle arrived at prime matter and gives a brief view of what the scholastics have done with what Aristotle gave them as a start.

FINIS

Footnotes

1. The Egyptians had the khat (body) and the khu (spirit) - (as well as the ka or shadow) as is shown by their Book of the Dead; the Chinese had Toa, the eternal, changeless being, and ki, the primordial breath; traces of such systems are plainly evident all through Genesis and especially where God made man from slime (matter), and breathed a soul (spirit) into him. A form of this sort of philosophy comes out in the Greeks Anaxagoras who was born about 500 B.C. For him it was mind and matter. For full details of his system see Turner, History of Philosophy, pp. 7 sqq. and Glenn, History of Philosophy, pp. 7 sqq. (Herder, St. Louis, 1934)
2. Turner, op. cit., p. 34; Glenn, op. cit., p. 36; John Burnet, Early Greek Philosophy, p. 92; John Burnet, Greek Philosophy, Thales to Plato, p. 27.
3. John Burnet, (Early Greek Philosophy).
4. John Burnet, Early Greek Philosophy; Turner, op. cit.; p. 37 sqq. Glenn op. cit. p. 38 sqq.
5. Phillips, R.P. Modern Thomistic Philosophy, Vol. 1, p. 37.
6. Bittle, C. N., O. F. M. Cap., From Aether to Cosmos, p. 265.
7. Bittle, ibid., p. 285
8. Nys, Cosmology, Vol. II, P. 3
9. Bittle, op. cit., p. 313
10. Gredt, Jos., Elementa Philosophia Aristotilico-Thomisticae, Vol. I, Thesis I, Para. 258, p. 218
11. Ibid. p. 210, para. 253
12. Aristotle, quoted from McKeon, R., (Basic Works of Aristotle), Physics, Bk. I, Ch. I, 184 b 15.
13. Ibid., 185.
14. Loc. cit.
15. Ibid., 185 a 17
16. Ibid., 185 a 20
17. Ibid., 1 -- 183 b; (pp. 1 -- 212)
18. St. Thomas Aquinas, In Physicam, Liber I, LX (Vives, vol. 22 p 279)
19. Aristotle, op. cit. 187 a 12.
20. E. I. Watkin, Philosophy of Form, Sheed and Ward, N. Y., p.9.
21. Refers to St. Thomas, Loc. Cit. (Primo manifestat, etc.)
22. St. Thomas, loc. cit.
23. Aristotle, op. cit. 188 a 28.
24. S. T. I. 33 1, Aristotle, Metaphysics, 5, 1 - 1013 a 17.
25. Aristotle, Physics, 188 a 29
26. Aristotle, ibid., 189 a 22
27. St. Thomas, In Physicam
28. Privation is defined: "Privatio est absentia formae naturalis generandae, in subiecto apto eam recipere." Pererii, B., S. J., De Communibus Omnium Rerum Naturalium Principiis et Affectionibus, p. 205. This of course refers to substantial changes. The form of the object undergoing the change, loses its form preparatory to gaining a new one. It is temporarily deprived of its form. For further details on substantial changes see: Gredt, op. cit. Vol. I, para. 374 sqq.; Aristotle, De Generatione et Corruptione 314-388: Nys, op. cit. Vol. II, p 17 sqq.

29. Aristotle, Physics, 190 a 34
30. Ibid. 189 a 33
31. Substantial change is a process whereby a thing loses one substantial form and gains another.
32. Aristotle, Physics, 190 b 6
33. Ibid., 190 b 10
34. Nys, op. cit., p 11
35. Ibid
36. Ibid
37. Ibid
38. Aristotle, Physics, 191 b 28
39. Ibid., 192 a 1
40. Ibid., 192 a 25
41. Ibid., 193 a 12
42. Ibid., 193 a 28
43. Refers to the quotation for footnote 41
44. Ibid., 193 b 7
45. Ibid., 194 a 19
46. Joannis a S. Thoma, Cursus Philosophicus Thomisticus, Tom. II, p 65
47. Grät, Vol. I Loc. cit.
48. Ibid
49. Joannis a S. Thoma, op. cit. p 65
50. St. Thomas, De Veritate 25, 1: Vives, Vol. 14
51. Joannis a S. Thoma, op. cit. p 67
52. Ibid., p 68
53. Grät, op. cit., Vol. I, p 166, para 209
54. This term seems to follow from and have its foundation in In Boeth de Trin., q. 4, a. 2, ad 4 where St. Thomas says:
 "Illa quae differunt numero in genere substantiae, non solum differunt accidentibus, sed etiam forma et materia. Sed si quaeretur, quare haec forma differt ab illa, non erit in alia ratione, nisi quia est in alia materia signata. Nec invenitur alia ratio, quare haec materia sit divisa ab illa, nisi propter quantitatem. Et. ideo materia subjecta dimensionem intelligitur esse principium huius diversitatis."
55. Grät, op. cit. Vol. I, p 295, para 386
 The quotation in footnote 55 contains ample proof for this.
56. Aristotle, Ethica Nicomachea, 1094 a 2
57. Johannes a S. Thoma, op. cit. p 59
58. Grät, op. cit. Vol. I para 260, p 220

BIBLIOGRAPHY

- Alamanno, A. Cosmo, S.J., Summa Philosophiae, (Lethielleux, Paris, 1894)
- Aristotle Aristotelis Opera Omnia, ed. by Ambrose Firmin Didot (Firmin Didot Bros., Paris, 1881)
- Aristotle Basic Works of Aristotle, edited by Richard McKeon, (Random House, New York, 1941)
- Bittle, Celestine, O.F.M., Cap., From Aether to Cosmos, (Bruce, Milwaukee, 1941)
- Burnet, J. D., Early Greek Philosophy, (Black, London, 1930)
- Burnet, J. D., Greek Philosophy, Thales to Plato, (MacMillan, London, 1942)
- De Maria, M, S.J., Philosophia Peripatetico-Scholastica, (Forzani, Rome, 1898)
- Eslick, "Reality of Matter in Creation," Vol. XVI, P. 46, New Scholasticism
- Farges and Barbedetti, Philosophia Scholastica, (Bastou, Berch, & Pagis, Paris, 1901)
- Gill, H.V., "Physics and Metaphysics," Thought, Vol. III, P. 396
- Glenn, Paul J. Cosmology, (Herder, St. Louis, 1939)
- Glenn, Paul J. History of Philosophy, (Herder, St. Louis, 1934)
- Gonzales, F. Z. Die Philosophiae des Heiligen Thomas von Aquin, III, (Manz, Regensburg, 1885)
- Goudin, P. F., Philosophia Dogmata, Vol. II, (Ed. Sarlit & Co., Paris 1886)
- Grandclaude, Breviarium Philosophiae Scholasticae, (Lethielleux, Paris, 1873)
- Gredt, Jos., O.S.B., Elementae Philosophiae, (Herder, Fribourg, 1937)
- Gutberlet, Dr. C., Lehrbuch der Philosophie, Vol. II, (Muenster, 1894)
- Hickey, S.J., O. Cist., Summula Philosophiae Scholasticae, (Benziger, New York, 1910)

- Joannis a S. Thomas, Cursus Philosophicus Thomisticus.
(Vives, Paris, 1883)
- Jowett, B., The Dialogues of Plato. (Jefferson,
Boston,)
- Kane, Wm. H., "Hylomorphism and the Recent Views
of the Constitution of Matter,"
Proceedings of the National Cath-
olic Philosophical Ass'n. Vol. XI,
P. 61
- Kleutgen, S. J., Philosophia Scholasticae, Vol. III,
(Gaume, Freres, & Duprey, Paris, 1869)
- Lehmen, Alfons, S. J., Lehrbuch der Philosophie, Vol. II
(Herdersche Verlagshandlung, Frei-
burg in Breisgau, 1901)
- Liberators, Matthaei, Institutiones Philosophicae, (Typis
Civilitatis Catholicae, Rome, 1857)
- Lottini, Fr. Joannus, Compendium Philosophiae Scholasticae,
Vol. I, (Typis S. Olin Eq. A. Ciardi,
Florentiae, 1900)
- Mancini, P. Fr. Hyieronimus, Elementa Philosophiae, Vol. II,
(Ex Typographia Polyglotta, Rome,
1897)
- Marling, "Hylomorphism and the Conversion
of Mass into Energy," New Scholas-
ticism, Vol. X, p. 311
- McWilliams, J. A., S.J., "Are substantial changes Instan-
taneous?" New Scholasticism,
Vol. XIV, p. 295
- McWilliams, J. A., S.J., Cosmology, (MacMillan Co., New York,
1942)
- McWilliams, J. A., S.J., Peripatetic Matter and Form,
Thought, Vol. I, p. 237
- McWilliams, J. A., S.J., Theories of Matter, New Scholasticism,
Vol. I, p. 297
- Mercier, Cardinal, A Manual of Scholastic Philosophy,
(B. Herder Book Co., St. Louis)
- Nys, D., Cosmology, Vol. II, (Bruce Pub-
lishing Co., Milwaukee)
- Nys, D., Cours de Philosophie, Vol. VII,
(Felix Alcan, Éditeur, Paris, 1906)
- Palmieri, Dominicus, S.J., Institutiones Philosophiae Vol. II
(Ex Typographia Della Pace, Romae, 1775)

- Pererii, B., S.J., De Communibus Omnium Rerum Naturalium Principiis et Affectionibus, (Francis Zantton et Bartholomew Tosium Co., Rome, 1576)
- Pesch, T., S.J., Institutiones Philosophiae Naturalis, (B. Herder Book Co., St. Louis, 1880)
- Pesch, T., S.J., Die Grossen Weltraetsel, Vol. II, (Herdersche Verlagshandlung, Freiburg in Breisgau, 1884)
- Phillips, R. P., Modern Thomistic Philosophy, Vol. I, (Burns, Oates and Washbourne, Ltd., London)
- Reinstadler, Dr. Seb., Elementa Philosophiae Scholasticae, (Herder, Friburgi Brisgovie, 1901)
- Remer, Vincentius, S.J., Summa Praelectionum Philosophicae Scholasticae, Vol. III (Ex Officina Libraria Giocetti, Felii et Soc., 1900)
- Roselli, Fr. S.M., Summa Philosophica, Tom. III, (Ex Typographia Henrici Spirani et Soc., Augustae Taurinorum, 1894)
- Rothenflue, Franc., S.J., Institutiones Philosophicae Theoreticae, Tom. III, (Perisse Freres, Parisiis, 1852)
- Russo, P. Nicolo, S.J., Summa Philosophica, (Marlier & Co., Boston, 1885)
- St. Thomas Aquinas, In Physicam (Ludovicus Vives, Editor, Paris, 1875)
- St. Thomas Aquinas, In Metaphysicam, (Ludovicus Vives, Editor, Paris, 1875)
- Schiffini, P. Sancto, S.J., Philosophia, Vol. III, (Ex Typographia Henrici Sperani et Soc., Augustae Taurinorum, 1894)
- Sharpless, Isaac, Sc. D., and Phillips, G.M., Ph.D., Natural Philosophy, (J. B. Lippincott Co., Philadelphia, 1883)
- Stattler, P. Benedicto, S.J., Philosophia Methodo Scientiis, Pars III, (Matthaei Rieger et Feli., 1769)
- Stoeckl, Dr. Albert, Lehrbuch der Philosophie, (Verlag von Franz Kirchheim, Mainz, 1887)
- Tangiorgi, Salvatoris, Institutiones Philosophicae, Vol. II, (Fred. Schoeningh, Paderbornae, 1865)

- | | |
|-------------------------------|---|
| Turner, Wm., S.T.D., | <u>History of Philosophy</u> , (Ginn & Co., Boston, 1903) |
| Uccello, R.P. Seb., S.S.S., | <u>Philosophia Scholastica</u> , (Petri Marietti, Augustae Taurinorum, 1921) |
| Urraburu, P. Jno. Jos., S.J., | <u>Institutiones Philosophicae</u> , Vol. III, (Typis Viduae ac Feliorum a Cuesta, Vallisoletti, 1892) |
| Van der Aa, J., S.J., | <u>Cursus Compendiarius Philosophiae Scholasticae</u> , (Typis Caroli Fonteyn, Lovanii, 1887) |
| Walsher, P. Hen., M.C., | <u>Institutiones Philosophicae</u> , Liber VI, (Matthaei Rieger, P.M., Feliorum, 1794) |
| Watkin, E.I., | <u>A Philosophy of Form</u> , (Sheed and Ward, Inc., New York, 1935) |
| Windle, Bertram C.A., F.R.S., | "Some Notes on Modern Ideas of the Constitution of Matter," <u>Proceedings of the National Catholic Philosophical Ass'n</u> , Vol. III p.29 |
| Zigliara, F.T.M., | <u>Summa Philosophica</u> , Vol. II, (Gabriel Baeuchesne, Paris, 1919) |

