A METAPHYSICAL ANALYSIS
OF LIFE

by
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"Why do you seek the Living among the dead?"

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CHAPTER I

Introduction: The Problem and the Method

The purpose of this brief note is to call attention to recent advances toward an adequate definition of life, and to the possibility that the problem of definition has actually been solved.

The new progress hinges largely on the biochemical concept of autocatalysis. The concept has become especially important during the last decade or two, particularly in connection with the virus and the enzyme. As the word implies, autocatalysis is the process in which a substance acts to catalyse, from its environment, additional quantities of the substance itself. Autocatalytic action is an obvious property of the virus, and on close examination it appears indeed to be the sole claim to animation which that organism is able to advance.

This general course of thought may perhaps be integrated in formal definitions. It seems reasonable now to say that 'life' is a collective term for 'living objects'; and a 'living object is an object which will absorb substances from some environment and synthesise from them a replication of each of the substances which comprise that object.'

It may, perhaps, seem reasonable to suppose that such a statement, would render useless a thesis expressly intended to work towards a definition of life; the author of the above text would have us believe that the task is completed - or, at least, nearly so. It is, however, precisely this kind of attitude and this kind of statement against which this thesis is directed.

THE PROBLEM OF DEFINITION. The term definition itself must be defined. The meanings of definition are as diverse as the sciences which attempt to define. Every science has its "definitions;" if it is a science of the real, its definitions must be obtained inductively.\(^2\) Therefore, they depend directly upon the method of the particular science. This means that to the extent that the method of a particular science is ordained to examine the nature of things, to the same extent are the "definitions" obtained, real definitions. Accordingly, we are able to distinguish three main types of so-called definitions claimed by the various modern sciences; the scientists themselves, however, usually would not use these terms: the essential definition (which leads to knowledge of the analogous nature of metaphysical

\(^2\)I am using the term "induction" after the manner of George P. Klubertanz, S.J., in The Philosophy of Human Nature, pp. 388-389: "It has already been suggested that a demonstrative knowledge has two stages: first, the stage of discovery or enquiry; second, that of critical evaluation or judgment upon the conclusions reached; or in other words, a stage of induction and a second stage of organization and evaluation (via inventionis, via judicij).

"The method of discovery or induction concerns the origin of the evidence with which one is to deal. At this point, there are two basically different methods. For some evidence is immediately presented in experience.... We can call this the method of 'intelligible induction.'

"On the other hand, many things cannot be discovered by immediate insight.... To arrive at an understanding, we have to use roundabout methods of investigation.... This roundabout and very complicated process of discovery we call 'rational induction.'" Philosophy proceeds from intelligible induction, physical science from rational induction.
definitions), the operational definition, and the construct.

The "essential definition," as one might suppose, is concerned with the essence of the thing defined. Its proper use is the logical classification of things according to genus and species. Thus, man is essentially defined as rational animal. There is nothing in reality that corresponds to this definition as such. There exists only this rational animal or that rational animal. A metaphysical analysis, then, does not conclude to a logical definition - except accidentally, in the sense that it is one and the same philosopher who uses logical definitions to classify those objects he is considering in order that he may be able to judge upon their metaphysical status. On the other hand, "metaphysical definition" as the result of a metaphysical analysis is not a contradiction in terms. It, too, attains to the nature of things including, however, the analogous character of reality, and not the univocal understanding of a logical definition. Metaphysical definition, therefore, is used in this thesis to mean the ontological status of a certain range of beings (in this case, all living beings) in so far as each of those beings in some way possesses some principle which is analogous to some principle in another (living) thing. And a metaphysical definition, founded as it is upon the esse of things, can only be analogous. Just as, while there really exists no universal as such, there is a foundation in reality for universals, so also there is a foundation in the ontological status of things whereby "life" can be predicated
(or not) of all of them. Even though the life of each living thing is radically different from that of every other living thing, still there is something the same secundum quid. This realization is what I term a metaphysical definition.

"Operational definition" must be distinguished; it is to be distinguished as that which is a principle of knowledge from that which is a conclusion. It is only through an analysis of the operations of a thing that we arrive at some idea of its nature (the express method of this thesis). In this sense, the operational definition adequately describes reality as it appears to the observer. Thus, man is a thing which nourishes itself, grows, reproduces, senses, desires, and is able to understand. I do not intend to give any philosophical connotations to the term "operational definition." I wish to use it to mean only the description of a thing in terms of the way it acts.

There is another type of operational definition, however, which I have called the "construct." The knowledge expressed in

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3I am using the term "construct" in the way suggested by Father Klubertanz in Introduction to the Philosophy of Being, pp. 262-263: "Constructural knowledge of the real has several characteristics. It is first of all -- at the level of scientific knowledge which is our main concern here -- selective ("abstractive")."

"Secondly, constructural knowledge of the real arises by rational induction. (Italics his)

"Thirdly, and most characteristically, constructural knowledge is indirect, that is, the knowledge of one thing in terms of another." And in his Philosophy of Human Nature, p. 391: "The
this definition is indirect and adds a "medium" to direct common-sense observation; and because the effect of this medium remains in the conclusion, this type of definition is called constructural. Notice that there is knowledge of reality: it is precisely with real things that the physicist, for example, is concerned. But because the physicist's technique includes laboratory control, the readings of instruments, a special methodology, it cannot but affect the type of knowledge he has. Physics, then, is a completely constructural science in this sense. In "defining" kinetic energy, for example, as mass x acceleration x distance, there is no attempt to understand the nature of energy nor to fathom the ontological reality of the operations producing such energy. Rather, energy is considered only in so far as the mind can mathematically measure its manifestations. Every note in the description of energy is a quantity; it has number-value. Again, the experimental psychologist will define emotions in terms of the

second consequence of the use of rational induction can be seen in the same example.... In some cases it seems to be possible to eliminate the technique or instrument from the statement of the conclusion by a further advance; but in very many other instances, the technique remains in the conclusion. In other words, not only is the procedure an indirect one; the very knowledge itself gained through such a technique is itself indirect, or constructural." This distinction is to be compared with that made by Jacques Maritain in The Degrees of Knowledge between empiricometric and anachistic knowledge. Chapter III of that work is relevant to this discussion.

bodily changes produced; some quantitative element is chosen to represent the nature of emotions. A construct, then, is an expression in quantitative terms of whatever is measurable in an observable object. This measurement is used as if it represented the very nature of the object. The construct is much like what Maritain means by "empiriological analysis."

In speaking of empiriological analysis or explanation we have said that such analysis deals with real possibilities of observation and measurement, with effectual physical operations. The permanent possibility of sensible verification and measurement plays the same role here as essence does for the philosopher ... it substitutes for it and takes its place....

Philosophically, the difference between the construct and the essential, metaphysical definition is the presence of the judgment of separation, the intellectual grasping of the fact that every agent as such is in act. We will see more of this as we proceed. Let me just state here that the distinction between the types of definition is based upon the distinction between process and operation. To submit the material thing only to measurement, is to become acquainted with the material conditions under which the agent is acting; these are the material processes of life. As such, these processes are the domain of the physical scientist. The "how" of these processes is the only "cause" in which he is interested. Thus, to say that a "living thing is an object which

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will absorb and synthesize substances" is to describe operations; but it is to describe them in terms of the experimentally observed processes of material life. Such a definition describes material vegetative life - but nothing more. Using the same observation of nutrition, the philosopher is able to separate the act of nutrition considered precisely as an act, from the material motions that accompany it. This latter understanding of activity is the first type of operational definition: that which leads to metaphysical knowledge.

THE PROBLEM OF LIFE. From these brief considerations, it should become apparent that knowledge of the true nature of things is scarce indeed. Most "definitions" we possess are descriptions of the way things operate. It is, of course, through observation of a thing's operations that we come to know what it is; rarely, however, is that step ever fully made. When it is made, usually the result is a logical classification of many under one, which, as such, finds no exact counterpart in reality. The insight into the nature of anything, then, in so far as that nature is real, is truly difficult; and the nature of life is probably the prime example of this difficulty.

Life is manifested in operations and movements. Life resists all efforts to "stabilize" it in a concept. Life is dynamic; it is a continuity of existence in a special way. Life is observable primarily as connected with matter; life is therefore
in some way measurable. All of these aspects of life have resulted in two main distortions of the nature of life. The first is to consider life as essentially operation; this has two forms, both denying substantiality, but the one being pan-vitalistic in terms of a vital force and flow as the essence of all reality, and the other overtly materialistic in stressing the process of nature in terms of motion in the strict sense. The second distortion is the reduction of vital operations to mechanical processes without necessarily denying the substantiality of the agent. There are, therefore, three problems to be faced and answered in analyzing the metaphysical status of life. The first is a question of method: Is a metaphysical analysis to be limited to what is measurable in material things? or in other words and more directly, What is the validity of the judgment of separation? Secondly, Is there any justification for positing the reality of anything but operation and at the same time preserving the evident dynamic character of life? Finally, Does the philosophic method warrant concluding to the existence of a reality (life) that is above the limitations of matter, time, and change and that at the same time does not exclude matter, time, and motion?

6See Henri Bergson, L'evolution Creatrice, Chapter III, "Creation et evolution."

7See Alfred N. Whitehead, Modes of Thought, Chapter III, "The Order of Nature" and especially pp. 156-158.
THE DIVISION OF SCIENCES. There is nothing more evident in the realm of sciences than the confusion that can result from an inadequate distinction and recognition of formal objects. One and the same subject is able to be treated under a number of different aspects and formalities, each constituting a different science. Thus, man, studied by a chemist is iron, hydrogen, chloride, etc.; a biologist considers him as composed of millions of living cells; the psychologist sees man as a bundle of nerves; the philosopher calls him a rational animal; and so on, in the various sciences. Does each science, therefore, define "man" with a real definition? Does "iron and hydrogen" express the same reality as "bundle of nerves" or as "rational animal"? Let us take our example of the nature of life and briefly examine the method of certain sciences in treating living things.

The object of biology is the material living thing precisely in so far as it is material and living. The method of biology is direct observation and the use of experiments. No conclusion is accepted unless it can be verified experimentally. Biology, then, studies living matter, especially in its ultimate constitution: the cell. All of its materials are objects of the senses. Biology is concerned with plant and animal life; and, indeed, because of its method, it can ask about no other form of life.

Psychology is divided into two main parts: philosophical and experimental. Philosophical psychology is considered a part of philosophy. It treats of the nature of man, a consideration
in terms of causes both of man's operations and of his essential constitution. Philosophical psychology, therefore, treats of human life; it extends only to that life whose principle is a soul, and, more properly, a rational soul. Experimental psychology, like biology, is a measuring science. Its method is observation and the use of experiments. It differs from biology in that what it observes and measures is the psychic state of the living thing in question. Experimental psychology is concerned with the manifestations of vital operations, more precisely, the material and physical manifestations of life-processes. This does not mean that the psychologist does not judge upon spiritual entities. It does mean that such a judgment is passed in terms of constructs. The "intelligence quotient" is a construct. This mathematical quantity does not measure the intellect of a spiritual being; it represents what is measurable in such an intellect's working of certain problems.

The philosophy of nature, too, is concerned with living things - but not only in their aspect of living. The philosophy of nature is wider than any of the above sciences; in fact, the highest stage of the philosophy of nature embraces at least in part a field of philosophical psychology. The philosophy of nature itself, however, is also limited in the extent to which it studies being. This science considers only material being; yet it includes an analysis of the causes of material being and so prepares the way for a higher science.
The sciences considered thus far, as most other sciences, are limited by their formal objects to a consideration of only a part of being. There is another science which considers being as such; this is metaphysics. The object of metaphysics is being in so far as it is being. This distinguishes metaphysics from biology, which considers being in so far as it is material and living; from psychology, which considers being in so far as it is sentient and manifests intellection; and from natural philosophy, which considers being in so far as it is material and subject to motion. Metaphysics studies the nature of what it means to exist; and existence is expressed in many ways. Two of the ways or modes of existence are classified as living and non-living. Now these are logical classifications of real things; when we have examined the metaphysical status of the beings represented in those classifications, we will find that there is as great a difference between the living things themselves as there is between those contradictions. And yet, as was mentioned before, there is something in all living things which validates such a classification. This is the analogous character of life. As we shall see, life, since it is nothing but a special mode of being, is analogous when said of the different grades of being; further, the metaphysical status of each individual in a particular grade of life is analogous, and not univocal, to that of every other individual.

In line with this distinction of formal objects, Maritain
distinguishes three types of biological knowledge.

First of all there will be an empiriometric or physico-mathematical biology, a biology which will tend ultimately to offer a mathematical interpretation of sensible data ... bearing on what may be called the material conditioning of life, the physico-chemical means of life. 

There would also be a biology that may be called typological or formally experimental biology. This would have life itself for its object and bear on the living being itself; but for its analysis of life it would use empiriological and not ontological ways of thinking, notions and definitions.

The third type of biological knowledge is this philosophical biology ... which is a particular chapter of the philosophy of nature and in which concepts will have their full intelligible freight, their whole speculative value without any forcing back toward the senses. In it explanation will be sought in terms of a raison d'être or principle of intelligibility and of essence....

Further, beyond and above the philosophy of nature, there is the metaphysical approach we intend to take here.

There is a method of investigation used in the physical sciences that is not to be limited to those sciences but belongs to science as such. This method has various names; usually, it is called "isolation." Under this method, the scientist isolates or separates from its environment the particular element in which he is interested. Isolation has two main forms. The first is the separating out of known elements in order to study one of those elements in itself. Thus, the bio-chemist examines the amount of protein in a serving of salmon. The second form pro-

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ceeds by way of negation. When examining a certain substance, for example, for the cause of a disease, the scientist discovers that the presence of three known factors, \( w \), \( x \), and \( y \), in other substances occasioned no disease. He, therefore, concludes to a fourth factor, \( z \), different than the three others. Upon examining the substance, he discovers the cause of the disease. He has isolated \( z \) by separating the impotent factors, \( w \), \( x \), and \( y \), from the whole substance. In a similar manner, but instead of microscope or spectroscope, the philosopher, using the insight of observation and reflection, separates causes from conditions and concludes to the existence of the "\( z \)" factor from the insufficiency of the other factors to explain the observation. In this manner, further, the metaphysician judges that a particular substance lives, not because it is material and has operations concerned with matter, but because it is also form and has its particular mode of existence as well as its operations precisely because of that form.

It must be stressed that this thesis is not part of the so-called "Mechanism vs Vitalism"\(^9\) debate. This "debate" is far from metaphysical grounds. First of all, both mechanists and vitalists recognize only material life: mechanists, insofar as they consider life to consist of matter in motion; vitalists, insofar as they consider life to spring from some sort of energy

\(^9\)See the Philosophical Review, vol. 27.
that is not exactly matter and yet is material. This stems more from their method than from anything else. Their investigation is biologic-psycho
doctical, using observation-measuring techniques. The stress is upon experiments; nothing is admitted except what is verified in the laboratory. Such an attitude rules out any possibility of an explanation of life that would include a non-material or even soul-less life. The metaphysician must consider such a possibility because his field is the whole realm of being, including what he can know of God. It may very well be that a philosopher can come to recognize an other than material cause of vital operations without explicitly recognizing the existence of God and separated substances; Hans Driesch did just that.10 Most of Aristotle’s De Anima is just that. This, however, it seems to me is a recognition of soul-life only; and the soul is the form of a material thing.11 When the philosopher recognizes the existence of other than material beings, his analysis of life is not truly metaphysical unless he finds it verified in those other beings. For, the highest form of material life touches the lowest of the


11St. Thomas Aquinas, In II Sent., 17, 2, 1, ad 1: Ad primum ergo dicendum, quod intellectus non negatur esse forma materialis quin det esse materiae sicut forma substantialis quantum ad esse primum; et ideo oportet quod ad divisionem materiae, quae causat diversa individua, sequatur etiam multiplicatio intellectus, idest animae intellectualis.
Secondly, most of the mechanists are rather united in their reduction of life to physico-chemical action.

During the nineteenth century every department of physical science has been tested and found useful in the study of organic phenomena, and at length we have won a certain measure of success in describing 'living matter' as a physico-chemical system. 13

Recall also the text with which this paper began. The author (Smith) in the same article says:

Contemporary psychology is a naturalistic discipline. Its introductory texts are discreetly mechanistic; its advanced texts are bolder. Its journals look down their noses at animistic terminology, and its heavier thinkers hasten to assure us that there must be 'neural correlates' for even their more elaborate constructs. 14

The reason for this attitude, of course, is to be found in their method. Having ruled out at the start anything that cannot be measured, the mechanists' phrasing of the problem itself is far from realistic.

12St. Thomas, De Librum de Sensu et Sensato, I, I, n. 4: Horum autem, intellectus quidem nullius partis corporis est, ut probatur tertio de Anima: unde non potest considerari per concretionem, vel applicationem ad corpus vel ad aliquod organum corporeum. Maxima anim concretio eius est in anima; summa autem eius abstractio est in substantiis separatis. Et ideo praeter librum de Anima Aristoteles non fecit librum de intellectu et intelligibili: vel si fecisset, non pertinere ad scientiam naturalem, sed magis ad metaphysicam, cujus est considerare de substantiis separatis.


14Kendon Smith, p. 330.
Thirdly, there are two classes of vitalists. The first is materialistic, the second, spiritualistic. Professor Rignano writes:

Attempts have been made to compare the assimilative process and the growth of living substance which sometimes follows with the growth of crystals in a salt solution. The two processes are, however, substantially different.15

Rignano spends a book trying to show the "substantial difference" between living and dead processes. Hans Driesch spent many years experimentally trying to prove the same thing. This one quotation from Rignano indicates their difference:

Driesch's 'entelechy' is represented, we repeat, as being an agent without a spatial seat, without a material basis and without energetic potentiality. Hence his comparison with the human intelligence and will, far from simplifying his idea, only tends to make it more obscure, since the 'entelechy' lacks all the spatial, material and energetic conditions which, according to the findings of psychology, are necessary for the functioning of the human intelligence and will themselves.16

Rignano, greatly desirous of finding an essential difference between organic and inorganic nature, does not make the necessary conclusion to an immaterial principle of life, but places his hopes in an "energetic vitalism" -- still quite material, still quite concerned with effects and not causes. Driesch does make the necessary conclusion to an immaterial cause; the need for

16Ibid., pp. 127-128.
an external influence to account for variation in a system.\textsuperscript{17}
And yet, attempting to establish this conclusion purely on an experimental basis, Driesch fails to escape the criticism of Rignano because he is dealing with men who consider measurable effects to be the only reality. I wonder if possibly the reason why Driesch's work concluding, as it does, to an immaterial principle of life, has failed to impress most modern scientists might be precisely because he has attempted to meet them with their own method. Using experiments and measurements upon material living things, Driesch concludes to a principle that cannot be measured in itself. To measure that principle in its effects is to return the problem to material bases. And these material bases are precisely all that the modern scientists will admit to be real. A study of the effects of living operations is far from a study of causes. Hence, biology and experimental psychology (adequately fulfilling their proper functions) are methodologically unable to ascertain the true nature of life.

I hope I have not appeared to belittle any science. My point is that the limitations of each science must be recognized. No science can pronounce upon the nature of anything when that science is methodologically committed to an examination of effects and conditions only. The results of that science may well be used in discovering natures; but to define after the manner of a

\textsuperscript{17}See Edward T. Smith, \textit{op. cit.}
philosopher in terms of the material conditions under which a living thing is observable is to fall into the construct-fallacy mentioned before. The scientist gives an excellent description of how material things appear to operate. But an analysis of the ultimate being and nature of things belongs to metaphysics. Of its very nature, metaphysics is ordered towards understanding the ultimate principles of reality.

A METAPHYSICAL ANALYSIS AND DEFINITION OF LIFE. Thus far I have attempted to give some idea of what this thesis is not. I have stressed the question of method because it is from that viewpoint that most misunderstandings of metaphysics have arisen. Especially since the time of Kant, metaphysics has been denied any real-value. It is often reduced to logic, the mere discussion of mental constructs. Metaphysical analysis, however, needs no justification when one understands what is meant by it. The metaphysical analysis of living things which I am using here has three notes: primarily, it is Thomistic; from this follows (2) the primacy of esse and (3) the validity of the judgment of separation.

1. To say that this thesis is Thomistic is not to say that it is not Aristotelian; rather, it is more than Aristotelian. If one were to read only the De Anima he would, perhaps, agree with Hammond when he says of Aristotle:

Soul is ascribed to all bodies whose principle of motion is inherent in their own nature. In other
words, it is to all organic bodies that Aristotle applies the term; to him the word 'soul' is synonymous with the word 'life.'

To equate soul with life, however, is to ignore certain texts of the *Metaphysics* and the *Ethics*. Here life is divine and beyond the form of a body. Whatever Aristotle meant, however, St. Thomas is clear to establish life as essentially independent of body and able to belong - in fact, pre-eminently - to spiritual substance.

2. To establish his principles of being, Aristotle, and St. Thomas following him, used his observations of the motions and changes of material things. From an analysis of change they both arrived at the principles of being: substance and accident. The same being may be modified "accidentally" while remaining essentially the same. A further observation and consideration revealed that there must also be a common substratum for a being that changes from one substance to another. From these two observations of accident and substantial change, there were born a realization of the principle of matter and form in composite substances and especially, and more generally, a realization of the principles of act and potency extending to all being. Thus

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19 Eth. Nic., 1177b26; Meta., 1072b17. These will be considered later.
far Aristotle, and St. Thomas with him.

It seems, however, that from the same observations, St. Thomas obtained a deeper insight into the full import of act and potency. Beyond the principles of substance and accident, of matter and form, St. Thomas recognised the principles of essence and existence. A term more precise than existence and one which I will use is, in Latin, esse — best translated, for purposes of this paper, as "act of existing." Since St. Thomas often defines life as the esse of living things, it would be well to come to some understanding of what he means by esse. This I hope to attain with some clarity in the course of the thesis. At this point, however, we should try to realise, to some extent, the metaphysical primacy that esse has for St. Thomas. Consider this text from the Summa:

It must be said that although in an angel there is no composition of form and matter, there is, however, in an angel, act and potency. This can be made evident from a consideration of material things, in which there is a twofold composition. The first composition is of form and matter, from which a certain nature is constituted. But a nature composed in this way is not its own existence (esse), but existence (esse) is its actuation (actus). On account of this, the nature itself is compared to its act of existing (esse) as potency to act. Therefore, when you take away matter and posit form itself subsisting apart from (non in) matter, still there remains the comparison of the form to the very act of existing.

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20 vivere viventis est esse, Quaest. Disp. de Veritate, IV, 8; vivere dicitur esse viventium, S. Th., II-II, 179, 1, ad 1; uno modo est ipsum esse viventis, Th I Sent., VIII, 5, 3, ad 3.; etc.
as of potency to act. 21

In another place, St. Thomas says:

Existence (esse) is the actuality of every form or nature; for neither goodness nor humanity is signified as being in act except in so far as we signify that it exists (eam esse). It is necessary, therefore, that the act of existing (esse) itself be compared to essence which is other than it, as act to potency. 22

Essence, then, is a principle of created being. It is "that by which" an essence exists. St. Thomas points out the various ways in which "that by which" (quo est) is said of material things. First of all, it is said of the substantial form. Prime matter and substantial form constitute an essence; the form is that by which the matter has existence. The information of matter makes a material whole proximately capable of receiving esse. Secondly, quo est, is said of that by which a thing is what it is: the essence, e.g., humanity. Neither substantial form nor the

21 St. Thomas, S. Th., I, 50, 2 ad 5. Ad tertium. Dicendum quod lieet in angelo non sit compositio formae et materiae, est tamen in eo actus et potentia. Quod quidem manifestum potest esse ex consideratione rerum materialium, in quibus invenitur duplex compositio. Prima quidem formae et materiae, ex quibus constituitur natura aliqua. Nature autem sic composita non est sumum esse, sed esse est actus eius. Unde ipsa natura comparatur ad sumum esse sicut potentia ad actum. Subtrahat ergo materia, posito quod ipsa forma subsistat non in materia, aedem manet comparatio formae ad ipsum esse ut potentiae ad actum. (The translations of St. Thomas are my own unless otherwise indicated.)

22 St. Thomas, S. Th., I, 3, 4, c. Esse est actualitas omnis formae vel naturae, non enim bonitas vel humanitas significatur in actu, nisi prout significamus eam esse. Oportet igitur quod ipsum esse comparetur ad essentian quae est alius ab ipsa, sicut actus ad potentiam.
essence itself, of themselves, make a being to be real; there is another principle, ipse actus essendi, whereby a thing is.23

Esse, as a principle of being, is that whereby a nature is placed in the order of real things. Metaphysics, if it is concerned with reality, must take account of this primary principle of being. It is not essence which is the object of metaphysics; it is the mode of existence which this essence has. This study of being in so far as it is, rather than in so far as it is some nature, distinguishes metaphysics from other sciences.

The philosophy of nature which verifies its conclusions by sense data, refers to the corruptible existence which alone can be attained by sensation in order to establish scientifically what are the objects it studies -- not only to know their mode of existence but also to know their essence.

Metaphysics, however, does not verify its conclusions in sense data, nor, like mathematics, in the imagination. Nevertheless, it too refers to the corruptible existence which can be attained by sensation. But it does so not to establish scientifically what are the realities it studies -- those namely of metaphysics, the being 'common to the ten predicaments,' created and material taken as being -- nor in order to know their essence. It does so to know how they exist, for this, too, metaphysics should know, to attain their mode of existence, and then to conceive by analogy the

23St. Thomas, De I Sent., VIII, 5, 2 c.: Unde in omnibus illis in quibus est compositio ex materia et forma, est etiam compositio ex quae est et quod est. In compositis autem ex materia et forma quae est potest dici tripliciter. Potest enim dici quod est ipsa forma partis, quae dat esse materiale. Potest etiam dici quod est ipse actus essendi, scilicet esse, sicut quo curritur, est actus currendi. Potest etiam dici quod est ipsa natura quae relinquitur ex conjunctione formae cum materia, ut humanitas.
existence of that which exists immaterially, which is purely spiritual.24

The life of a plant is a mode of being; the life of an animal, the life of man are modes of being; the life of an angel, the life of God are modes of being. Vivere nihil aliud est quam esse in tali natura.25 And "life" signifies this esse, but in an abstract manner.26 The nature of life, then, belongs to a study of metaphysics; life is to be given in a particular, rather than general, way, the primacy that esse itself has. For, to live is as act compared to the potency that is a potentially alive essence before that essence exists.

3. From these considerations, it should be clear what is meant by a judgment of separation. Metaphysics, since it is the study of the nature of things in their first principles and causes, must -- as a point of proper method -- proceed by "separating" the essential from the accidental, the causes from the conditions, the principles from the things constituted by principles. The negative judgment of separation is a complex reasoning process wherein by understanding what does not account for a particular experience, we rise to the knowledge of what does account for it. For example, a being is real not because of its essence


25St. Thomas, S. Th., I, 18, 2 c.

26Ibid.
(since this refers to no more than its intelligible content); it is real because it has an act of existing. In this way, metaphysics ascends to knowledge of things in their causes, attributing operations to proper sources. Even though the metaphysician begins with his direct experiences, takes his start from an analysis of material things, and only after much reflection ascends to principles that are independent of matter, if such there be, once those principles are attained he is able to turn to the whole realm of being and understand, to some extent, at least, the constitution, existence, and operation of all things.

To conclude this first chapter:

1. My primary intention was to show how a metaphysical analysis of life differs from any other analysis. This metaphysical analysis is seen to be an insight into real things; not a construction of the mind but the fruit of the mind's own activity whose connection with sense experience is readily seen in a causal analysis of knowledge. We have seen the place of metaphysical analysis in the "hierarchy" of the sciences more by what it is not; the remaining pages are intended to indicate what it is.

2. We have seen how it is possible to have philosophical knowledge other than univocal, essential definitions; the judgment of separation will lead us to an analogical knowledge of the nature of life.

3. Our method is an intelligible induction from those things
that are evidently living. This inductive approach to the metaphysical problem of life gives us a basis in experience from which by separating causes from conditions we will be able to attain a knowledge of what pertains to life as such, as a manner of existing.
CHAPTER II

The Starting Point: The Physical World

From those things that are evidently living, we can understand to which things it belongs to live and to which it does not belong to live. It is evident, however, that to live belongs to animals. For, it is said (De Plantis) that life is manifested in animals. Therefore, it is according to this that it is necessary to distinguish the living from the non-living, namely, in that respect in which animals are said to live. This aspect is the one under which life is first of all manifested, and under which the last traces of life remain. --For, we say that an animal lives, first of all when it begins of itself to have motion; and the animal is judged to live just so long as such motion appears in it. When, however, it no longer has any motion of itself, but is moved only by another, then the animal is said to be dead on account of a failing of life.¹

MOVEMENT AS INDICATIVE OF LIFE. There is no better vindication of the real-value of metaphysics than to follow step-by-step that induction whereby the principles of metaphysics are gleaned from experience of the world -- whether our personal experience

¹St. Thomas, S. Th., I, 18, 1 c: Respondes dicendum quod ex his quae manifeste vivunt, accipere possimus quorum sit vivere, et quorum non sit vivere. Vivere autem manifeste animalibus convenit. Dicitur enim, (De Plantis) quod vita in animalibus manifesta est. Unde secundum illud oportet distinguere viventia a non viventibus, secundum quod animalia dicuntur vivere. Hoc autem est in quo primo manifestatur vita, et in quo ultima remanet. --Primo autem dicimus animal vivere, quando incipit ex se motum habere, et tamdiu judicatur animal vivere, quamdiu talis motus in eo apparat; quando vero jam ex se non habet aliquem motum, sed movetur tantum ab alio, tunc dicitur animal mortuum per defectum vitae.
or that of another. To talk about the nature of life is meaningless without having analyzed what it is in living things whereby they live. Such an analysis or consideration consists in examining the forms of life that are objects of our experience in order to determine the principle and source of the vital activity. There are three possible approaches along this line. In the first place, there is the scientist who scourrs the sea-bed looking for the simplest form of life; he feels that greater forms of life are only elaborations of amoebae. The main difficulty with such an approach is, as Aristotle points out, that there are many things which we would be hard put to to decide whether they are alive or not, or whether they are plant or animal. Secondly, there is the rather idealistic philosopher who considers life in its fullest as it would be found in God; only secondarily does he then apply "life" to creatures. Unless, however, what is known of the life of God is known only after and because of knowledge of the life of creatures, such a philosopher builds castles in the sky and has no hope of discussing reality. The third path is followed by Aristotle and St. Thomas and consists in examining life as it is "most evident" to us. Since it is movement that gives us the first manifestation of life and since it is lack of movement that in the last analysis forces us to judge that this thing is no longer living, it is from an understanding of motion itself, of that special type of motion we call "activity," and of the principle and source of motion and
activity, that we come to understand something of life.

Such an approach to the problem as is outlined above, renders irrelevant a discussion along the lines of M. Adler's Problem of Species. Dr. Adler is interested in determining the number of different species of things: whether the inanimate constitutes one or several species; whether the number of souls is more than three. There is great difficulty in deciding such questions, as Adler quotes Aristotle to indicate:

Nature proceeds little by little from lifeless to animal life in such a way that it is impossible to determine the exact line of demarcation, nor on which side thereof an intermediate form should lie. Thus, next after lifeless things in the upward scale comes the plant, and of plants one will differ from another as to its amount of apparent vitality.... Indeed, there is observed in plants a continuous scale of ascent towards the animal. So, in the sea, there are certain objects concerning which one would be at a loss to determine whether they be animal or vegetable .... In regard to sensibility, some animals give no indication whatsoever of it, whilst others indicate it distinctly.... And so throughout the entire animal scale there is a graduated differentiation in amount of vitality and in capacity for motion.

But what Dr. Adler does show and what Aristotle points out is that there are classifications: plant and animal. The qualifications of these classes are known from those members which give evidence of these qualities, so that a failure to place this or that thing

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3 Ibid., p. 103: Aristotle, Hist. Animalium, VIII, 1, 588b 4-22.
in one definite class is due to ignorance of the nature of that thing. This means that animal life is distinguishable from plant, that human life is distinguishable from animal. Above all, it indicates that there is a distinction of life from non-life. Consequently, the result of our investigation is not to give us a rule whereby we may decide what sort of living thing this or that material individual is. This is the work of the biologist or zoologist. Rather, we are interested in determining what belongs to life as such, so that what we say will apply to life wherever it is found. We begin, then, with life as it is most evident; and we attempt to understand its intimate nature. The first evidence we observe about life is its connection with motion.

It is not, however, any type of motion which indicates life. Motion is analogous as it is found in things. The primary analogate, motion in the strict sense, is the actuality of that which exists in potency and in so far as it is in potency. This type of motion is the process itself, the very transition from a state of potency to that of act. Its "reality" consists in the continuous actualization of a potency; its reality is that of a thing which is on the way to being actual and in so far as it is only "on the way" and has not as yet been actualized. This type of motion ceases when the new perfection is gained; its reality, then, is of the lowest type: it is the actuality of an imperfect

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4 Aristotle, *Physics* III, 1, 201b5.
being, that is, of a being in potency. Motion, in this sense, is "becoming" rather than "being." Thus, a building while it is being built is in fieri; it is imperfect with respect to the completed building which exists in esse. Such motion is always the result of some other activity, whether that other activity be itself motion or something else. It is always the result of some other activity, because its reality consists precisely in the process whereby a thing is reduced from potency to act. And nothing is reduced from potency to act except by something already in act.

In other words, this type of motion is always caused "by another." Whatever is moved is moved by something other. This is the type of motion to which St. Thomas refers when he says: "when it is moved only by another, then it is said to be dead." Motion in the strict sense, then, the act of that which exists in potency, is said of non-living things in so far as they are being moved by something else. Therefore, it is not an examination of this type of motion that will lead us to an understanding of life.

A secondary analogate of motion, in a wide sense of the term,

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5St. Thomas, S. Th., I, 18, 3 ad 1: ... motus est actus mobilis... [est] actus imperfecti, scilicet existentis in potentia...

6St. Thomas, In VII Meta., lect. 2, #1278: Actus autem naturaliter prior est potentia. Et simpliciter loquendo prior tempore, quia non movetur potentia ad actum nisi per ens actu.

7St. Thomas, S. Th., I, 18, 1 c.
is more properly called "activity."\textsuperscript{8} The term "activity" is used to indicate the self-possession of this type of motion. Activity is analogously called "motion" because, as motion in the strict sense is the act of the one moved, activity or operation is the act of the one acting.\textsuperscript{9} Activity, however, is the act of a being which exists in act and in so far as it is in act. This is the meaning of the term "self-motion." This type of motion, activity, has its source within the being itself. The term "self-motion," then, has two references: it refers both to the source of the motion and to its term. When a being of itself begins to move itself, it is said to live. Now, the source of the motion is able to be only the activity of the being; if this source of motion were motion in the strict sense, it would be caused from without, and we would not have an example of self-motion. What is meant is only this, that a distinction must be made between motion in a being that is received from outside (and this we have called "motion in the strict sense") and motion that is from the being itself (and this we have called "activity"). This is a minimal distinction of life from non-life, but it is an important

\textsuperscript{8} St. Thomas, \textit{S. Th.}, I, 18, 3 ad 1.

\textsuperscript{9} St. Thomas, \textit{S. Th.}, I, 18, 3 ad 1: Unde quia motus est actus mobilis, secunda actio inquantum est actus operantis, dicitur motus ejus, ex haec similitudine, quod sicut motus est actus mobilis, ita hujusmodi actio est actus agentis; licet motus sit actus imperfecti, scilicet existentis in potentia, hujusmodi autem actio sit actus perfecti, id est existentis in actu.
one. We must now turn to an analysis of activity.

ACTIVITY. We have pointed out that self-motion or activity is the sign of life. Secondly, we have seen how motion in the strict sense has its source either in another extrinsic motion (as when one billiard ball in motion imparts motion to another billiard ball) or in an activity (as when a living being imparts motion to a material thing). Activity itself, however, is of two types.\(^{10}\) First of all, there is the activity that has its source in the agent, but proceeds from that agent and produces an effect outside of that agent. This type of activity is called "transient;" this is the activity which is of the predicament "action." Action is the perfection of the thing acted upon, rather than of the agent itself: \(\textit{actio est in passo}.\)\(^{11}\) As such, with regard to its term, this action is not distinguished from motion in the strict sense when concerned with material things. This transient action is the passion "suffered" by the patient; it is the change or motion which is produced in a patient but considered as

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\(^{10}\)St. Thomas, \textit{Quaest. Disp. de Potentia Dei}, III, 15 c: \(\text{Duplex est actio: quaedam quae consistit in ipso agente, et est perfectio et actus agentis, ut intelligere, velle, et hujusmodi; quaedam vero quae egreditur ab agente in patiente extrinsecum et est perfectio et actus patientis, sicut calefacere, movere, et hujusmodi.}\)

\(^{11}\)St. Thomas, \textit{In I Sent.}, 40, 1, 1 ad 1: \(\text{Operatio enim agentis quaedam est ut transiens in effectum, et haec proprie actio vel passio dicitur, et tali actioni semper respondet e converso passio; unde inventur calefactio actio et calefactio passio, et similiter creatio actio et creatio passio.}\)
received from the agent. There are two conclusions we may draw from this:

1. Transient action considered in its final cause is the same as motion in the strict sense; that is, it is the act of an imperfect being; the perfection of the thing moved.

2. But, transient action considered in its efficient cause, namely, as proceeding from a being, is distinguished: either it is a transmitted action (as motion in the strict sense) or it is initiated action. This latter belongs to a living being. And yet, because transient action belongs to both living and non-living things, it is not this type of activity that represents the nature of life.

There is a second type of activity which has its source in the agent and remains within the agent, perfecting none but the agent itself. This activity is called "immanent action;" its proper name is "operation." Even within immanent action, how-

12St. Thomas, S. Th., 1, 41, 1 ad 2: ... actio secundum primam nominis impositionem importat originem motus. Sicut enim motus, prout est in mobili ab aliquo, dicitur passio, ita origo ipsius motus, secundum quod incipit ab alia et terminatur in id quod movetur, vocatur actio.

13See Note 9.

14St. Thomas, Quaest. Disp. de Veritate, VIII, 6 c: Respondendo dicendum, quod duplex est actio. Una quae procedit ab agente in rem exteriorem, quam transmutat; et haec est sicut illuminare; quae etiam proprie actio nominatur. Alia vero actio est, quae non procedit in rem exteriorem, sed stat in ipso agente ut perfectio ipsius; et haec proprie dicitur operatio, et haec est sicut lucere.
ever, there is a distinction to be made. First, there is that action which begins and ends in the agent but is the action of one part of the agent upon another part. This action is immanent in that it remains within the agent; but it is transient in its effect, in that one part acts upon another. This type of action is most evident in material living things wherein, for example, a dog moves himself from place to place. This is the primary meaning of "self-mover:" one part of a material thing moves another part of itself.

Secondly, there is that activity, or operation, which has no further end than the operation itself. Thus, to see is an operation and an end in itself. This type of activity -- operation, and especially that operation which is an end in itself -- is the true indication of life.

OPERATION AND NATURE. Two things are said to differ essentially if one of them has a set of operations which the other does not have. This principle is founded upon a very basic

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15St. Thomas, In IX Meta., lect. 8, #1862: Quia enim dixerat, quod opus est finis, posset aliquis credere, quod hoc esset verum in omnibus. Sed ipse hoc removet, dicens, quod quorumdam activarum potentiarum ultimus finis est solus usus potentiae, et non aliquid operatum per actionem potentiae; sicut ultimus finis potentiae visivae est visio, et praeter eam non fit a potentia visiva aliquid operatum.

16St. Thomas, II Contra Gentes, 68: Invenimus enim aliquas infimas formas quae in nulam operationem possunt nisi ad quam se extendunt qualitates quae sunt dispositiones materiae, ut calidum, frigidum, humidum, siccum, rarum, deusum, grave et leve,
experience: our awareness of the diversity among activities.
Without going through a complete explanation of the hylomorphic composition of material things, it is sufficient to point out that accidental and substantial changes show a matter/form composition in which substantial form determines or specifies the particular essence or nature which the thing possesses. This substantial form is a cause of the thing's existence and actuality. But things existing in act are able to exercise actions only in so far as they are in act. A thing is not able to act in that respect in which it is only in potency; if in potency, it does not have the perfection; and a thing is not able to give what it does not have. Since the being is able to act in so far as it is in act, its activity must follow the mode of being and

et his similia, sicut formae elementorum; unde istae sunt formae omnino materiales et totaliter immersae materiae. Super'has inveniuntur formae mixtorum corporum, quae ... operantur ... virtute ... quae consequitur eorum speciem, sicut adamas trahit ferrum. Super has iterum inveniuntur aliquae formae quarum operationes extenduntur ad aliquam operata quae excedunt virtutem qualitatum praedictarum, quamvis qualitates praedictae organicae ad harum operationes deserviant sicut sunt animae plantarum.... cf. also, Quest. Disp. unica de Spirit. Creat. art. II, c.

17St. Thomas, S. Th., I-II, 179, 1 ad 1: Ad primum ergo dicendum quod prorsa forma uniuscuiusque faciens ipsum esse in actu, est principium operationis prorsae ejus.

18St. Thomas, Quaest. Disp. de Veritate, VIII, 6 c: Res autem existentia actu possunt agere actiones secundum quod sunt actu....
actuality which it has. Thus it is that an agent produces things in its own likeness; and the activities of a thing, in general, manifest the kind of thing it is. Because of this, we are able to know a thing from the activities it initiates. Therefore, just on the purely experiential level, we are able to show an essential difference between two things when we are able to indicate two irreducible sets of activities. The evident conclusion from these considerations is that a living thing differs from a non-living thing precisely because it has a set of activities (immanent actions) which are not found in a non-living thing. What these activities are and what they mean will be examined later.

Having concluded, however, to different types of being corresponding to different sets of activities, there yet remains to decide in what this difference of "types" consists. To a philosopher who holds that all things are bodies and what is not a body is nothing, the source of these immanent activities, if real, must also be a body. On the contrary, however, St. Thomas points out that it is not because this body is a body that it is living;

19 St. Thomas, S. Th., I, 76, 1 c: Illud enim quo primo aliquid operatur, est forma eius cui operatio attribuitur.... Et huius ratio est, quia nihil agit nisi secundum quod est actu; unde quo aliquid est actu, eo agit.

20 St. Thomas, II Contra Gentes, I: Rei cuiuslibet perfecta cognitio haberi non potest nisi eius operatio cognoscitur. Ex modo enim operationis et specie mensura et qualitas virtutis pensatur. Virtus vero naturam rei monstrat.
rather, it is because it is a certain type of body — or else, all bodies, as such, would be living. This is a basic experience and intuition, and points to a diversity of principles to explain differences of kind. That is, matter of itself is indeterminate; to explain the diversity of material things — the real essential diversity — it is necessary to recognize a principle whereby matter is actually a certain kind of material thing. That by which a material thing is actually a determinate type of being, is its act, or its form. Thus, in a living thing, a formal, actual element is needed to explain its essential difference from a non-living thing: this is the soul, a non-corporeal principle of being which is the act of a living body and thus the first principle of life.

21 St. Thomas, S. Th., 1, 75, 1 c: Quamvis autem aliquod corpus possit esse quoddam principium vitae, sicut cor est principium vitae in animali; tamen aliquod corpus non potest esse primum principium vitae. Manifestum est enim quod esse principium vitae, vel vivens, non convenit corpori ex hoc quod est corpus; alioquin omne corpus esset vivens aut principium vitae. Convenit igitur aliquid corpori quod sit vivens, vel etiam principium vitae, per hoc quod est tale corpus. Quod autem est actu tale, habet hoc ab aliquo principio, quod dicitur actus ejus. Anima igitur, quae est primum principium vitae, non est corpus, sed corporis actus.

22 St. Thomas, In VII Meta., lect. 2, #1278: Unde patet, quod forma est prior quam materia, et etiam est magis ens quam ipsa, quia propter quod unumquodque et illud magis. Materia autem non fit ens actu nisi per formam. Unde oportet quod forma sit magis ens quam materia.

23 Aristotle, De Anima, 412a27-412b6: Hence soul is the first actuality of a natural body having in it the capacity of life.... the soul will be the first actuality of a natural body furnished with organs. (All translations of De Anima are J. A. Smith's, unless otherwise noted.)
All that we have determined so far is that the typifying principle of body cannot itself be body. This is the insight afforded by the judgment of separation: "it is evident that to be a principle of life, or living, does not belong to a body precisely as body, otherwise every body would be living or a principle of life; therefore, it belongs to some body which is living, or even which is a principle of life, for this reason that it is a definite type of body." Therefore, the reality of a non-corporeal element is arrived at by recognizing the inability of corporeal elements to explain all the observations.

In concluding that the source of vital activities must be other than material, we leave open the possibility that there exists some life that is completely independent of matter. Although the judgment of separation shows that the source of life is non-corporeal, it does not posit the existence of an immaterial living being. And yet, from our analysis of a material living being, concluding, as we do, that the soul must be non-corporeal, we have metaphysical certainty that life is not closed to spiritual beings, if there are any. Further, some of the same evidence which led us to make this judgment of separation, also impels us to decide whether there actually is any life which is intrinsically independent of matter. For, since the activities of a thing flow from its nature, we are able to know that nature from an

24St. Thomas, S. Th., 1, 75, 1 c.
analysis of the activities. And since, as we have already pointed out, a difference of activities indicates a difference of natures, if we discover any set of activities which is intrinsically independent of matter, we would have to posit a nature, a type of living, itself intrinsically independent of matter. It is with these principles in mind that in the third chapter we will take up an examination and analysis of the various activities which are manifested by living things.

SOUL AS PRINCIPLE OF LIFE. All activities of any being whatsoever proceed, as from their ultimate source, from that whereby this being is made actual. This principle of actuality is called "form;" in living beings, it is called "soul." The soul is the ultimate principle of activity of any living thing: it means simply that the substantial form of that thing represents the actualization of a potentially living being. This implies two things:

1. Soul is the principle of life only in those beings which are composed of matter and form; any subsistent form would itself be an ultimate principle of vital activities.

2. The soul is the ultimate principle of vital activities;

25 St. Thomas, II Contra Gentes, 68: Unumquodque enim operatur secundum quod est; unde forma sujus operatio excedit conditionem materiae, et ipsa, secundum dignitatem sui esse, superexcedit materiam.

26 See Note 24.
a composite being of necessity needs certain **proximate** principles through which the soul acts. These proximate principles of activity may be either material or immaterial: material, as the organ of the eye; immaterial as the power of sight itself — as we shall see.

The fact that the soul is the form of the body precludes any question as to a dualism, as Ragussa puts it:

The soul is not merely operationally present in the body as in Plato where it plays the role of mover to moved, but it is existentially present as part of the organism's actual constitution. It reduces the bare potentiality of the material body into a positive actuality. Thus it is useless to question whether the soul and body are one, since together they form a complete substantial union.27

Consequently, we must define a little more clearly what is meant by "self-mover." In one sense it is not true that the soul moves the body,

since it is the body's form, and not properly distinct (aliud quid) from it. It is, we repeat, a constituent, not a mover.28

On the other hand, as actual principle, the soul does move the body in the sense of being the ultimate source of all the activities that are attributed to an animate body. As "giver of esse," the soul, then, is the basis for the living body's existence as

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living and as able to perform vital activities. As Aristotle says:

The soul is the cause or source of the living body. The terms cause and source have many senses. But the soul is the cause of its body alike in all three senses which we explicitly recognize. It is (a) the source or origin of movement, it is (b) the end, it is (c) the essence of the whole living body.

That it is the last, is clear; for in everything the essence is identical with the ground of its being, and here, in the case of living things, their being is to live, and of their being and their living the soul in them is the cause or source.29

Aristotle, of course, is taking "essence" in its strict sense of that which constitutes a being in its species. The specific form of a living thing, its soul, is such a principle.

It is to be noticed that "soul" is introduced only to be left, relatively, in the background. As we pointed out, "soul" is proper only to beings composed of matter and form. Therefore, soul does not belong to life as such, but only to those material living things. To say that soul belongs to life as such is to pre-judge the possibility of a soul-less life of an immaterial being. As a matter of fact, we will investigate soul-life because our experience is concerned with that; but having determined what it means to live in material beings, because we have already "separated" life from matter, our conclusions will embrace soul-less life as well.

29Aristotle, De Anima, 415b8-14.
To conclude:

1. The points brought out in this chapter are not new or difficult to understand by one versed in St. Thomas' philosophy.

2. I have tried, however, to stress the existential and experiential basis of the principles we find in our first analysis of living things.

3. All these principles are necessary for understanding the next parts of the thesis; they will be applied in our attempt to understand the nature of a living thing.
CHAPTER III

The Intuition: The Grades of Life

But since the modes of life are multiple, if only one of them is in a thing, that thing is said to be living and animated. Life, he [Aristotle] says, shows itself in four modes: (1) as intellectual; (2) as sensitive; (3) as the cause of motion or rest in space; (4) as the cause of the motions of taking nourishment, decay and growth. He distinguishes only these four modes, although he has already distinguished five main types of vital activity, and this because he is thinking here and now of the degree of animate being.... The appetitive power, which makes a fifth type of vitality, does not, however, imply a distinct grade of living being; for it always accompanies sensation.1

MATERIAL LIVING THINGS. In the previous chapter we discovered that immanent activity, or operation, is the sign of life. In this chapter we will analyze different kinds of operation, with the purpose of determining the precise nature of the being that is

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1St. Thomas, In II de Anima, lect. 3, #254-255: Sed cum multiplex sit modus vivendi, si unus tantum eorum insit aliquid, dicitur illud vivens et animatum. Ponit autem quatuor modos vivendi: quorum unus est per intellectum, secundus per sensum, tertius per motum et statum localem, quartus per motum alimenti, et decrementi et augmenti. Ideo autem quatuor tantum modos ponit vivendi, cum supra quinque genera operationum animae posuerit, quia hic intendit distinguere modos vivendi, secundum gradus viventium; qui distinguenterunt secundum haec quatuor.... Appetitivum autem, quod est quintum praeter haec quatuor, non facit aliquam diversitatem in gradibus viventium. Nam ubicunque est sensus, ibi est et appetitus. Cf. also In I de Sensu et Sensato, lect. 1, #3. (The translation and numbering are from K. Foster, Aristotle's De Anima; the Latin text is from the Parma edition.)
able to act in that way. One of the first things we notice about living things is the difference of vital activities to be found among them. In understanding this difference in activity, there are two possible positions: either the differences are simply different and irreducible, one to another; or they are so reducible. We saw on the very first page of this thesis, that there are numerous attempts not only to reduce all vital activities to one, but to reduce both living and non-living to a common denominator. This, of course, is the first hope of the physical scientist: to explain all of the physical world in terms of the least number of concepts. We have seen to what extent this is possible. As long as only the material processes are considered, there are great likenesses to be found among material living things in some of their operations. As far as the "activities" of electrons are concerned, there is even likeness between these non-living elements and living things. But how far this analysis is still in contact with reality is questionable. Such an analysis is concerned with bodies -- not as a genus of material things, but only as a part of a whole, as St. Thomas distinguishes in De Ente et Essentia.2

2St. Thomas, De Ente, c. III, §1: Potest ergo hoc nomen corpus rem quamdam designare, quae habet talem formam, ex qua sequitur in ipsa designabilitas trium dimensionum cum praeclamione [italics mine], ut scilicet ex illa forma nulla ulterioris perfectio sequatur, sed si aliquid aliud superadditur, sit praeter significacionem corporis, sic dicti; et hoc modo corpus erit materialis et integralis pars animalis: quia sic anima erit praeter id quod significatum est nomine corporis, et superveniens ipsi corpori.
A philosophical analysis is concerned with the whole individual, including the soul which makes the body this living body. Such an analysis agrees with St. Thomas when he says:

For it is not of this alone that a thing has increase and decrease that it lives, but a thing is said to live also because it senses and understands and is able to perform other works proper to life.\(^3\)

For to sense and to understand are immanent activities, and for this reason are they vital activities.

In what way, therefore, are vegetation, sensation, local movement, intellection and appetite "immanent activities"? In what way do they give us a metaphysical understanding of life?

1. Vegetation. The activities proper to vegetative life are growth, nutrition, and reproduction.\(^4\) By growth is meant the assimilation of matter for purposes of development and increase in size. This is not a process of mere addition, like brick upon brick; rather the assimilated food is constructed by the living thing itself into new parts of the living thing itself. The

\(^3\)St. Thomas, In II De Anima, lect. 1, #219: Non enim ex hoc solo quod aliquid habet augmentum et decrementum vivat, sed etiam ex hoc quod sentit et intelligit, et alia opera vitae exercere potest.

\(^4\)Aristotle, De Anima, 416b11-14: There is, however, a difference between nutritivity and conducivity to growth. In so far as the animate thing is quantitative, what is taken promotes growth; in so far as it is a definite individual, what is taken nourishes. For the animate thing preserves its substance or essential nature and exists as long as it is nourished; and it causes the production, not of what is nourished, but of another individual like it. Its essential nature already exists, and nothing generates itself; it only maintains its existence.
material accumulation itself is called "growth"; the fact that by this assimilation the individual substance is preserved, is called "nutrition." "Metabolism" is the general word which includes the processes of catabolism and anabolism: the loss and restoration of energy and matter for the purpose of maintaining the existence of the vegetable. Thirdly, living things reproduce themselves. When the plant (or animal) has reached a certain state of maturity, it brings new and distinct living individuals into being. A part of the living thing is separated from the parent(s) and becomes a new individual. That this may be accomplished, however, the generative activities are first of all directed to the perfection of the parents that they may be able to reproduce their kind.

It is evident that physico-chemical processes are present in


6For Aristotle, this phenomenon was a clear indication of the (more or less futile) striving of corruptible things to share in the divine. Life -- all kinds of life -- in some way participated divine activity. The continuation of the species was the closest corruptible things could come to divine eternity. De Anima, 415a23-68: It follows that first of all we must treat of nutrition and reproduction, for the nutritive soul is found along with all the others and is the most primitive and widely distributed power of soul, being indeed that one in virtue of which all are said to have life. The acts in which it manifests itself are reproduction and the use of food -- reproduction, I say, for any living thing that has reached its normal development and which is not mutilated and whose mode of generation is not spontaneous, the most natural act is the production of another like itself, an animal producing an animal, a plant a plant, in order that, as far as its nature allows, it may partake in the eternal and di-
any vegetative activity. But as Father Fabro points out,\(^7\) it is not the presence of these forces that characterizes life, but the peculiar way in which the organism uses these forces in the vital activity. This is the force of our judgment of separation: to distinguish the causes of vital activity from the conditions and means. This is also the force of Aristotle’s distinction of three components in the nutritive activity: "that which is nourished \(\text{[the ensouled body]}\), that with which it is nourished \(\text{[nutriment]}\), and that which nourishes it \(\text{[the soul]}\)."\(^8\)

2. Sensation. The Thomistic principle of formal object

vine. That is the goal towards which all things strive, that for the sake of which they do whatsoever their nature renders possible. The phrase ‘for the sake of which’ is ambiguous; it may mean either (a) the end to achieve which, or (b) the being in whose interest, the act is done. Since then no living thing is able to partake in what is eternal and divine by uninterrupted continuance (for nothing perishable can forever remain one and the same), it tries to achieve that end in the only way possible to it, and success is possible in varying degrees; so it remains not indeed as the self-same individual but continues its existence in something like itself -- not numerically but specifically one.

\(^7\)G. Fabro, "Un Saggio de filosofia della biologia" Bolletino Filosofico, vol. 3, p. 70; L'A. infatti comincia con il riconoscere che in ogni manifestazione vitale de ordine inferiore (vegetativo) vi è di fatto presente un aspetto fisico-chemico, poiché il vivente non risulta di altri elementi e non si può costruire e conservare per altre forze.... La peculiarità della vita ... non va cercata nella presenza di energie (ed effetti) d'ordine estra-fisico, ma nel modo diverso di operare che le medesime forze presentano nei due mondi inorganico ed organico.\(^8\) Il principio vitale è quindi benis specifico e superiore alle forze della fisico-chimica poiché le regola e le domina, ma insieme ha la sua attività legata alle medesime come a mezzi necessari....

\(^8\)Aristotle, De Anima, 416b20-23.
analysis clearly shows that sensation is a different kind of activity than those considered under "vegetation." The object of the activity is the possession by the one sensing of the material form of the one sensed, without, however, actually taking up and assimilating the latter's physical being. This is to possess another "immaterially," and it is really the definition of knowledge. With regard to sensation, consider this text from Aristotle:\(^9\)

For that which perceives must be an extended magnitude. Sensitivity, however, is not an extended magnitude, nor is the sense: they are rather a certain character or power of the organ. From this it is evident why excesses in the sensible objects destroy the sense-organs.... It is evident, again, why plants have no sensation, although they have one part of soul and are obviously affected by tangible objects, for their temperature can be raised and lowered. The reason is that they have in them no mean, no principle capable of receiving the forms of sensible objects without their matter, but on the contrary, when they are acted upon, the matter acts upon them as well.

a) There is a distinction made between the one who senses (a material being) and the sense power together with the act of sensation itself (immaterial in its mode of operation, since its act is precisely to possess the form of another without loss of its own natural form). The sense-power, however, informs the organ, as St. Thomas points out,\(^{10}\) and shares being with it.

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\(^9\) Aristotle, *De Anima*, 424a26-b3.

\(^{10}\) St. Thomas, *In II De Anima*, lect. 24, #555: Et dicit quod primum sensitivum, idest primum organum sensus est in quo est potentia hujusmodi, quae scilicet est susceptiva specierum sine materia. Organum enim sensus, cum potentia ipsa, utputa oculus,
This is why excess in the sensible object which destroys the organ, also impairs the operation of the sense power.

b) Sensation differs from vegetation in that the one sensing receives the form of the sensible object without taking up its physical existence, while the plant receives the form and matter both. The reason for this is that the sense power is not any of its objects (contraries) and so is able to receive them. The plant is not such a mean; it is entirely material both in being and operation, limited to the possession of its own form. The sentient being is material in its existence, but immaterial in its operation, in that it is able to possess forms other than its own.

c) In either case, the activities are immanent -- they proceed from the one acting (plant or animal) and they perfect the one acting. For this reason are they vital activities.

3) Appetition. This is perhaps the place to introduce appetition, since:

all animals, have at least one sense, touch; and, where sensation is found, there is pleasure and pain, and that which causes pleasure and pain; and where these are, there also is desire, desire being appetite for what is est idem subjecto, sed esse aliud est, quia ratione differt potentia a corpore. Potentia enim est quasi forma organi, ut supra traditum est. Et ideo subdit quod magnitudo, idest organum corporeum est, quod sensum patitur; idest quod est susceptivum sensus, sicut materia formas. Non tamen est eadem ratio magnitudinis et sensitiv i sive sensus, sed sensus est quaedam ratio, idest propricio et forma et potentia illius, scilicet magnitudinis.
pleasurable.\textsuperscript{11}
Appetite follows upon knowledge; the good being presented, its perfection known (either sensually or intellectually), it becomes a possible object of desire. Again, desire (or aversion) is an activity of a living being which is initiated within it for its own perfection.

4. \textit{Intelligence}. The intellect is a power distinct from any we have so far considered, with its own activity and its own proper object. Its distinctive activity is manifested in a true language; its proper object is being. It is a form of knowledge whose activity is supra-material and supra-temporal (while sensation is both material and temporal) and whose object is grasped without even the conditions of matter. The evidence of the supra-temporality of language is expressed by Father Klubertanz in this way:\textsuperscript{12}

For example, to make a statement, and to arrange the words properly to form a sentence, it is necessary to have the whole meaning of the sentence in mind throughout each of its parts. Therefore, the act which generates language is a unifying, synthesizing act, which exists as a whole throughout an entire series of material activities.... The act which dominates the successive must itself be without succession. The kind of unity that the sentence (or other complete expression of thought) has as a meaningful sign involves a unifying act which is extended neither in space nor in time. But that which is not extended in space or time is in no sense material.

\textsuperscript{11}Aristotle, \textit{De Anima}, 414\textsuperscript{b}2-7.

Because, therefore, the act of understanding is in this way "separated" from (i.e., independent of) matter, the power which produces that act as well as the nature from which that power proceeds must be "separated" from matter. That is to say, the intellectual soul is intrinsically independent of matter both in its operation and in its existence. This latter fact is called "spirituality." There are other lines of evidence (such as the universality of intellectual knowledge) which lead to the same conclusion and are investigated elsewhere. The principal concern of this thesis is the implications contained in the fact that here is a vital (immanent) activity that is intrinsically independent of matter. A definition of "living thing" as "that which synthesizes materials into its own substance" does not include the life of intellect. A definition in terms of immanent activity does include the life of intellect.

5. Locomotion. Quite simply, locomotion is caused by both knowledge and appetency together with a part of the body as the instrument whereby the whole being is moved toward the desired object. Consider Aristotle on this point:  

13St. Thomas, In IV Sent., d. 49, l. 2, qst. 3 c: Operatio autem non mensuratur tempore nisi secundum quod est motui adjunctae: unde et operationes quae non adjunguntur motui, sed termino motus, non mensurantur tempore, sed instanti, ut patet de illuminatone. Et ideo si est aliqua operatio omnio transcendentem motum, talis operatio non mensurabitur tempore, sed mensura quae est supra tempus.

14De Anima, 433b13-21.
Now motion implies three things, first that which causes motion, secondly that whereby it causes motion, and again, thirdly, that which is moved; and of these, that which causes motion is two-fold, firstly, that which is itself unmoved and, secondly, that which both causes motion and is itself moved. The unmoved mover is the practical good [as known], that which is moved and causes motion is the appetitive faculty (for the animal which is moved is moved in so far as it desires, and desire is a species of motion or activity) and, finally, the thing moved is the animal. But the instrument with which desire moves it, once reached, is a part of the body; hence it must be dealt with under the functions common to body and soul.

All the activities we have considered, then, are immanent activities, activities indicating a living being. We have seen that these activities, while all are immanent, still differ among each other and radically so. We have seen that knowledge is a different type of activity than nutrition; and further, understanding is a different type of activity than sensation. (Appetition and locomotion are subsumed under sensitive and intellectual life.) Because of an irreducible difference on the level of activity, we were led to posit an essential difference on the level of existence:

1) the non-living is essentially different than the living;

15Aristotle, De Anima, 433a13: Both these, then, are the causes of locomotion, intelligence and appetite.... and 433a9: For men often act contrary to knowledge in obedience to their imaginings, [if we regard imagination as one species of thinking], while in the other animals there is no process of thinking or reasoning, but solely imagination.

16See Chapter Two of this thesis.
2) the sentient is essentially different than the vegetative;

3) the intellective is essentially different than the sentient.

And the last type includes an immaterial existence which is called "spiritual."

THE GRADES OF MATERIAL LIFE. In the preceding section, we considered living things in two ways: in the first way, we distinguished five types of immanent activity; in the second way we reduced these five to three grades of life. The ratio of the distinction is founded upon whether the object or the subject of the activity is considered.\textsuperscript{17} The formal object analysis disclosed five types of activities; but if we distinguish the mode

\textsuperscript{17}St. Thomas, Quaest. Disp. de Veritate, X, 1 ad 2: 'Ad secundum dicendum, quod genera potentiarum animae distinguuntur dupliciter: uno modo ex parte objecti; alio modo ex parte subjecti, sive ex parte modi agendi, quod in idem redit. Si igitur distinguuntur ex parte objecti, sic inveniuntur quinque potentiarum genera supra enumerata. Si autem distinguuntur ex parte subjecti vel modi agendi, sic sunt tria genera potentiarum animae; scilicet vegetativum, sensitivum, et intellectivum. Operatio enim animae tripliciter potest se habere ad materiam. Uno modo ita quod per modum naturalis actionis exerceatur; et talium actionum principium est potentia nutritiva, cujus actus exerceretur qualitatis activis et passivis, sicut et aliae actiones materiales. Alio modo ita quod operatio animae non pertingat ad ipsam materiam, sed solum ad materiae conditiones; sicut est in actibus potentiae sensitivae; in sensu enim recipitur species sine materia, sed tamen cum materiae conditionibus. Tertio modo ita quod operatio animae excedat et materiam et materiae conditiones; et sic est pars animae intellectiva.
of acting, on the part of the subject, there are three genera of vital powers, the vegetative, the sentient, and the intellectual. The reason for this distinction is found in the soul's relation to matter. In the first type of power, vegetative, the soul exercises its natural mode of activity (as distinguished from an elicited or acquired mode) by means of active and passive qualities whose term is precisely the material object as material. Thus, the plant takes in matter to add to its quantity. Secondly, the operation of the soul may tend not to the matter itself of an object, but only to the material conditions of particularity, space and time. This is the manner of operation of the sensitive power which grasps the form of a material object under the conditions of matter but without the physical material existence which that object has in reality. The third relation which a soul can have to matter is to entirely exceed it and the conditions of materiality, grasping the form of an object apart from its particularity, space, and time. As we have seen this is proper to intellectual activity. One way, therefore, to distinguish the grades of life is by the relation of vital activity to matter.

A second way is expressed by John of St. Thomas. Since what is common to all living things is that they move themselves, he
sends, there is a three-fold distinction of living things because there are three ways of moving oneself. For, the principles of motion are agent and end: end with respect to direction and orientation of the motion, agent with respect to the execution of the motion (and also the form which is the proximate principle of motion as existing in the agent and representative of the end).

Some living things move themselves only with respect to the execution of the motion, since form and end are completely determined for them by their nature. This is the vegetable life.19

Other living things move themselves both with respect to the execution of motion and with respect to acquiring forms (in know-

18 John of St. Thomas, Cursus Philosophicus, vol. 3, p. 3840 and ff.: ... quod omni viventi et omni animae commune est seip-sum movere, et in hoc primum distinguitur a non vivente, quia non vivens tantum movetur ab alio, vivens autem movet seipsum. Quare diversitas vitae ex diverso modo se movendi debet desumti. Est autem triplex modus se movendi, ergo et triplex vita. Minor probatur, quia principium motus est agens et finis, finis quidem quod directionem et allicentiam, agent autem quod executionem. Executio autem dependet ab aliqua forma tamquam a principali principio et ab instrumento tamquam a medio operanti. See also St. Thomas, S. Th., I, 18, 3 o.

19 Ibid., Aliqua ergo sunt, quae moveunt seipsa solum quod ex-actionem motus, non vero ad acquirendum finem vel formam, quibus moveant se, sed tam finis quam forma operandi sunt illis determinata a nature et passive illis dantur, non se movent ad illa. Et hic est infimus gradus vitae, scilicet vegetativus. Plantae enim moveunt se quod executionem nutritionis et generationis, non tamen finem sibi praestituunt, neque formas, quibus operentur, acquirunt.
ledge) which can be a source of motion. This is sense life, in which the principles of operation are not all determined by nature, but are "intentionally" unitive of the mover with the object of its motion.

And in the third place, there are those beings that move themselves even in so far as they determine the ends of their activity, which are not completely determined for them by nature. Not only the end is chosen, but proportionate means also. Thus, intellective beings move themselves omni modo.

To sum up some of the things we have seen:

1. Immanent activity is the sign of life.

2. There are different ways in which activity can be immanent; these ways are precisely the distinctions among types of

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20 Ibid., Alia vero sunt, quae movent seipsa non solum quoad executionem motus, sed etiam quoad ipsas formas, quae possunt esse principium motus, quia non habent illas determinates a natura, sed acquirere illas possunt. Et huiusmodi est vita sensitiva. Sensus enim licet sint potentiae operativae, tamen indigent formis intentionalibus, quibus objecta uniuntur potentis, a quibus tamquam a principiis formalibus et specificativis operationes suae dependent. Unde iste modus se movendi altior est quam modus vitae vegetativae, quia principia operandi non sunt totaliter determinata a natura sicut in vegetativis, sed ad ea possunt se movere; potentiae enim sensitivae indifferentes sunt ad has vel illas species seu objecta.

21 Ibid., Alia denique movent seipsa etiam quoad determinate- nes finis, quia non habent a natura totaliter determinatum finem, sed illum sibi praestitunt, et ita non aguntur in cognoscendo finem, sed se agunt ideoque indigent ratione conferente proportionem finis cum mediiis, et sic movent se omni modo, quo aliquid se movere potest, scilicet, quoad finem et quoad formas operandi et quoad executionem motus.
living things.

3. The different types of life have a common referent in matter, on the one hand, to which they have different relations; and they have a common referent in principles of motion, to which they have different relations.

4. These relations suggest not only a difference among the types of living things, but a graded difference in which one type is superior to another. The basis for superiority in a certain grade of life, St. Thomas says, is found in the degree of immanence in the being's activity. To the extent that the activity produced by a being has its origin in and terminates within that being, to that extent is that being higher than and superior to another whose activity is not so immanent. The word St. Thomas uses to express this "remaining in" is intimum. "From the higher natures, things proceed in a more intimate way." 22 The converse

22St. Thomas, Contra Gentes, IV, c. 11: Principium autem huius intentionis hinc sumere sportet, quod, secundum diversitatem naturarum, diversus emanationis modus inventur in rebus; et quanto aligua natura est altior, tanto id quod ex ea emanat magis est intimum. In rebus enim omnibus inanimata corpora inimum locum tenet, in quibus emanationes aliter esse non possunt nisi in actionem unius eorum in aliquod alterum; sic enim ex igne generationis ignis, dum ab igne corpus extraneum alteratur et ad qualitatem et speciem ignis producitur. Post inanimata vero corpora, proximum locum tenent plantae, in quibus jam emanatio ex interiori procedit, inquantum scilicet humor plantae intraneus in semen convertitur et illud semen terrae mandatum crescit in plantam. Jam ergo hic primus gradus vitae inventur; nam viventia sunt quae seipsa movent ad agentium, illa vero quae non nisi exteriora movere possunt omnino sunt vita carentia; in plantis vero hoc indicium vitae est quod id quod in ipsis est movet aliquam formam. Est tamen vita plantarum imperfecta, quia, emanatio in eis licet ab
of this statement represents the a posteriori way which we have adopted to analyze living things; those natures whose activities are more intimate are higher natures.

The more the proper activity of a nature begins and terminates within that nature, the more "intimate" it is; and the less it needs of what is exterior to it, the higher is that nature and the more perfect is its life. For inanimate things, there is no possible emanation except by the action of one upon another. This is, first of all, motion in the strict sense; secondly, there are various chemical actions and the "natural motions" of atomic particles. In these "actions," however, one object (or part) moves another extraneous to it. But "living things are those

interiori procedat, tamen paulatim ab interioribus exiens quod emanat finaliter omnino extrinsecum inventur; humor enim arboris primo ab arbore agredientis fit flos et tandem fructus ab arboris cortice discretus, sed ei colligatus; perfecto autem fructu, omnino ab arbore separatur, et, in terram cadens, sementina virtute productum aliam plantam. Si quis etiam diligenter consideret, primum huius emanationis principium ab exteriori sumitur; nam humor intrinsecus arboris per radices a terra sumitur, de qua planta suscipit nutrimentum. Ultra plantarum vero vitam, altior gradus vitae inventur, quae est secundum animam sensitivam, cujus emanatio propria esti ab exteriori incipiat, in interiori terminatur; et, quanto emanatio magis incesserit, tanto magis ad intima devenitur; sensibile enim exterius formam suam exterioribus sensibus ingerit, a quibus procedit in imaginationem et ulterius in memoriae thesaurum. In quolibet tamen huius emanationis processu principium et terminus pertinent ad diversa; non enim aliqua potentia sensitiva in seipsam reflectitur. Est ergo hic gradus vitae tanto altior quam vita plantarum quanto operatio huius vitae magis in intimis continetur, non tamen est omnino vita perfecta, cum emanatio fit semper ex uno in alterum. Est igitur supremus et perfectus gradus vitae, qui est secundum intellectum; nam intellectus in seipsum reflectitur, et seipsum intelligere potest.
which move themselves to act." And this moving of oneself is found in its lowest form in plants.

For, in plants, a certain "intrinsic humour" is converted to seed which, with the action of the soil, is converted into another plant. This presence in a plant of a principle that is the cause of a form, is a sign of life. For, the cause of form can be only another form -- which, being an intrinsic principle of action, acts through the whole being to produce what eventually is another of the same species with the same power of reproduction. In the plant, however, there is only an imperfect life; for, although the emanation proceeds from within, yet little by little it is exteriorised until at last it is completely other than its principle. As a matter of fact, even the first principle of this vegetative emanation is something extrinsic to the plant; for it receives its nourishment from the soil, and through many processes that nourishment is converted into seed.

But there is a higher form of life: that of the sensitive soul which is found in animals. Although its proper emanation proceeds from without, for the sense receives the impression of external objects, yet it terminates within. This activity becomes more and more intrinsic (more and more intimate) as the emanation proceeds from the external senses to the imagination and even to the sense memory. Even in this emanation, however, there is a difference of subject with respect to the beginning and the end of the activity. For, as St. Thomas points out, "no
sensitive power reflects upon itself." Therefore, while this
grade of life is higher than plant life, still it is also imper­
fect, because the principle of the vital activity is other than
the term. It is the power of self-reflection, knowledge of one­
self, that indicates the perfection of life; and this perfection
is had in life "according to intellect."

St. Thomas, however, points out that there are degrees of
intellectual life. The lowest is the human; for, although man
is able to reflect upon himself, still the first source of his
knowledge comes from without. Man's intellectual knowledge de­
pends upon phantasms. This is not an intrinsic dependence; but,
consequent to the body-soul unit that man is, all knowledge in
some way has its origin in sense and is therefore ab extrinseco.
And to repeat once more, because the actual operation of under­
standing itself is not dependent upon the material organs of
sense, or any other body, the human intellect is the spiritual

23 Ibid., Sed et in intellectuali vita diversi gradus inveni­
untur. Nam intellectus humanus, etsi seipsum cognoscere possit,
tamen primum sui cognitionis initium ab extrinseco sumit; quia
non est intelligere sine phantasmate, ut ex superioribus [lib. II,
c. 60] patet, Perfection igitur est intellectualis vita in an­
gelis, in quibus intellectus ad sui cognitionem non procedit ex
aliquo exteriori, sed per se cognoscit seipsum [Ibid., c. 96 seq.].
Nondum tamen ad ultimam perfectionem vita ipsorum pertingit:
quia, licet intentio intellecta sit eas omnia intrinseca, non
tamen ipsa intentio intellecta est eorum substantia; quia non est
idem in eas intelligere et esse, ut ex superioribus [Ibid., c. 52]
patet. --Ultima igitur perfectio vitae competit Deo, in quo non
est aliud intelligere et aliud esse, ut supra [lib. I, c. 45]
estensum est, et ita oportet quod intentio intellecta in Deo sit
ipsa divina essentia.
power of a subsistent soul. 24

The knowledge which an angel has, St. Thomas continues, needs no beginning from things outside of him; to that extent it is entirely intrinsic. But to understand, in an angel, is other than to be. This diversity, therefore, prevents the angel from possessing the full perfection of life.

Only in God, then, in Whom to understand is the same as to be, is complete immanence, complete intimacy of activity found; and therefore, in God there is the perfection of life.

Notice that it is important to realize the basis for validly predicating life of angels and of God. In the second chapter, we separated life from any material limitation; in this chapter we have seen to a greater extent how the activities of life are prop-

24St. Thomas explains the different ways in which the sense and intellect use bodies in their act of knowing in I De Anima, lect. 2, #19-20: "Nam intelligere quodammodo est proprium animae, quodammodo est conjuncti. Scierunt est igitur, quod aliqua operatio animae aut passio est, quae indiget corpore sicut instrumento et sicut objecto. Sicut videre indiget corpore, sicut objecto, quia color, qui est objectum visus, est in corpore. Item sicut instrumento; quia visio, etsi sit ab anima, non est tamen nisi per organum visus, scilicet pupillam, quae est ut instrumentum; et sic videre non est animae tantum, sed est organi. Aliqua autem operatio est, quae indiget corpore, non tamen sicut instrumento, sed sicut objecto tantum.... Hoc modo phantasmata se habent ad intellectum, sicut colores ad visum.... Ex hoc duo sequuntur. Unum est, quod intelligere est propria operatio animae, et non indiget corpore nisi ut objecto tantum, ut dictum est: videre autem et aliae operationes et passiones non sunt animae tantum, sed conjuncti. Aliud est, quod habet operationem per se, habet etiam esse et subsistentiam per se; et illud, quod non habet operationem per se, non habet esse per se. Et ideo intellectus est forma subsistens, aliae potentiae sunt formae in materia."
erly and essentially called "immanent" and are not to be limited to vegetative activities. Therefore, given the existence of angels and of God, if their activity is intellectual, as it must be, then they are said to live and to live in a much more perfect way than any material living thing.

SELF-PERFECTION OR "ASEITAS." The various modes of life, therefore, are graded according as the source and term of activity are intimate to the living thing. The perfect state of such intimacy is called "aseitas" by M. Tornatore. This is probably best rendered in English as "self-perfection." To move oneself, then, in the wide use of the term motion, belongs to living things; and the more perfectly a thing moves itself as far as the possession of principle and term of motion, the more perfect its life. For any activity there are three "parts": the principles of the activity, the activity itself, and the term of the activity. The proportionate perfection of immanent activity con-


26St. Thomas, S. Th., I, 18, 3 c: Ad cuius evidentiam considerandum est quod cum vivere dicantur aliqua secundum quod operantur ex seipsis, et non quasi ab aliis mota; quanto perfectius competit hoc allicui, tanto perfectius in eo inventur vita.
sists in just this: to what extent are these parts identified? That what we call "life" consists in some kind of autonomous activity, no one will deny. That there can be no more autonomous activity than when principles of activity, activity itself, and term of activity are intrinsic to the operating subject is likewise evident. A little reflection will suffice to show that this is true only in an intellect knowing itself when such intellection is identical with the very being of the knower. Having proved that God exists and is intelligent, it follows necessarily that He is His own understanding of Himself. He is the knower, in no way dependent upon anything outside Himself for the source of His knowledge (for nothing but Himself is the adequate object of His knowledge); and the term of His knowledge, His idea of Himself as object with relation to Himself as knower, is nothing but His divine essence itself - identity itself, but called knower and known because of our poor understanding of the activity of God. In this way is the activity of God most immanent, most in-

27 St. Thomas, In XII Meta., lect. 8, #2544: Et dicit quod Deus est ipsa vita. Quod sic probat: "Actus intellectus" idest intelligere, vita quaedam est, et est perfectissimum quod est in vita. Nam actus, secundum quod ostensum est, perfection est potentia. Unde intellectus in actu perfectius vivit quam intellectus in potentia, sicut vigilens quam dormiens. Sed illud primum, sicut Deus, est ipse actus. Intellectus enim eius est ipsum suum intelligere. Alioquin comparetur ad ipsum ut potentia ad actum. Ostensum est supra, quod eius substantia est actus. Unde relinquitur quod ipsa Dei substantia sit vita, et actus eius sit vita ipsius optima et sempiterna, quae est secundum se subsistens. See also S. Th., I, 18, 4 c.
timate, most truly life. Other beings are said to live in so far as they approximate this intimacy of knowing oneself.

An angel\(^{28}\) knows himself directly; yet his knowledge of himself is not his very essence. There is a kind of composition in the angel's nature; there is a composition (besides essence and existence) of essence and act of knowledge,\(^{29}\) a composition analogous to the composition of material beings. For an angel is not a perfect immaterial being such as God is. Although the angel's composition is in the immaterial order, still it is a composition, a "part-to-part" analogous to matter's "part-outside-of-part."

Such a composition puts the angel's power for intimate immanent activity below that of the purely simple immateriality that God is. Man, of his nature partly material, is dependent upon that matter (in his present state) for the beginning of his intellect. For although, as intellect, he too can know himself, such

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\(^{28}\)St. Thomas, Contra Gentes, II, c. 91: Adhuc, natura superior in suo infimo contingit naturam inferioriorem in ejus suprmo. Natura autem intellectualis est superior corporali; contingit autem eam secundum aliquem partem sui quae est anima intellectiva. Oportet igitur quod, sicut corpus perfectum per animam intellectualiam est supremum in genere corporum, ita anima intellectiva quae unitur corpori sit infima in genere substantiarum intellectualium. Sunt igitur aliquae substantiae intellectualae non unitae corporibus, superiores secundum naturae ordinem animae. See also Contra Gentes, II, c. 97.

\(^{29}\)St. Thomas, S. Th., I, 54, 3 c: Actus ad quem comparatur potentia operativa, est operatio. In angelo autem non est idem intelligere et esse; nec aliqua alia operatio aut in ipso, aut in quocumque alio creato, est idem quod ejus esse. Unde essentia angeli non est ejus potentia intellectiva; nec alicujus creati essentia est eius operativa potentia.
self-knowledge is possible only after his intellect has been actuated by a species from the matter of his senses. Thus, his knowing is less intimate, less immanent, less of life than that of an angel or of God.

Sensitive animality has no power of self-reflection owing to its complete immersion in matter without a subsisting immaterial form that is able to reflect upon itself of itself (even though, as in the case of man, it may need the matter of its reflection from without). It has an analogous self-knowledge, in that it knows, sensibly, what is good for it (self-protection, food) and can reproduce its species. The plant has no knowledge whatsoever, but its activity is also directed to its own increase and self-production. Therefore, it has a care for itself which follows upon some sort of knowledge, albeit, not its own.

In this way we see to a certain extent how all things share in the perfect existence of God. Their sharing, of course, is in a greatly imperfect way; but still the assitas proper to God alone is reflected in plant life and even in the dynamic existence of non-living things.

SUMMARY. Thus far our investigation of living things has concluded to:

1. Operationally, life is the capacity for immanent activity. What this implies will be taken up in the last chapter.

2. A philosophical analysis of material life in terms of
causes "separated" from conditions, leads us to conclude to a definition that transcends material life.

3. Thus, "life" is more extensive than "soul"; for separated substances and God Himself, because they have immanent activities, are said to live, but without a "principle of life," a soul.30

4. The perfection of life, being the perfect immanence of activity in which principle, activity, and term are identical, is found in God. Other things live with a life more or less perfect as their activity approaches or recedes from the perfection of the activity of God.

5. In chapter four, we will draw out the implications of the principles and conclusions we have established in these first three chapters, especially with regard to relating our operational definition of life to St. Thomas' dictum that vivere est esse viventibus.

To conclude: What intuition, what insight has this analysis of life given us? The insight is three-fold:

30St. Thomas, S. Th., I, 18, 3 ad 2: Ad secundum dicendum, quod sicut Deus est ipsum summ esse et summ intelligere, ita et sumum vivere. Et propter hoc sic vivit, quod non habet vivendi principium. See also ibid., ad 5: Ad tertium dicendum, quod vita in istis inferioribus recipitur in natura corruptibili, quae indiget et generatione ad conservationem speciei, et alimento ad conservationem individui. Et propter hoc in istis inferioribus non inventur vita sine anima vegetibili. Sed hoc non habet locus in rebus incorruptibilibus.
1. There are grades or degrees among living things; not only is there life, but there are kinds of life, differing as more and less perfect.

2. The measure of the perfection of life is found in the intimacy or self-possession of the vital activity.

3. This difference in the degree of perfection indicates the analogous nature of life, which will be discussed at length in the next chapter.
CHAPTER IV

The Definition: Motion, Operation, Substantiality

That being is said to have life which through and of itself has nourishment, increase, and decrease. It must be understood, however, that this explanation is more by way of example than by way of definition. For, it is not of this alone that a thing has increase and decrease that it lives, but a thing is said to live also because it senses and understands and is able to perform other works proper to life. From this consideration we see that there is life in the separated substances for this reason, that they have intellect and will (as is clear in the eleventh book of the *Metaphysics*), although there is no growth or nourishment in them. But because in these generable and corruptible things, the vegetative soul to which nourishment and growth pertain (as was said at the end of the first book) is the principle of life, here there is given by way of example of that "having life," that which has nourishment and growth. The proper ratio of life, however, is from this that a thing is of such a nature as to move itself, taking motion in the wide sense, in so far as the intellectual operation is called some kind of motion. For, we say that a being is without life which can be moved only by an exterior source.¹

This text serves both as a summary of what we have seen and as an introduction to what follows. It emphasizes the "separated"

¹St. Thomas, *In II De Anima*, lect. 1, #219: Illud autem dicetur habere vitam, quod per seipsam habet alimentum, augmentum et decrementum. Sciendum autem est, quod hoc explanatory magis est per modum exempli, quam per modum definitionis. Non enim ex hoc solo quod aliquid habet augmentum et decrementum vivit, sed etiam ex hoc quod sentit et intelligit, et alia opera vitae exercere potest. Unde in substantialiis separatis est vita ex hoc quod habent intellectum et voluntatem, ut patet in undecimo *Metaphysicæ*, licet non sit in eis augmentum et alimentum. Sed quia in
character of life, its non-dependence, of itself, upon material conditions; and also it re-introduces "motion" which we will now study under another aspect: its relation to operation.

MOTION VS. OPERATION. St. Thomas often uses terms in very analogous ways; it is practically impossible to determine one precise meaning for a term. This is especially the case with "motion." It has been said many times that a living thing is that which is able to "move itself." As we pointed out in the second chapter, this phrase may have two meanings: one, signifying the transient action of one part of a living thing upon another part of itself; the other signifying an operation itself. We will now investigate this second use of "move oneself" by doing two things: 1) by adequately distinguishing motion in the strict sense from operation; and 2) by determining why operation is widely or even improperly said to be self-motion.

First of all, St. Thomas points out that a thing is said to be living when one of the two types of motion is found in it: that motion whereby one part moves another part, or that motion

**istis generabilibus et corruptibilibus anima, quae est in plantis, ad quam pertinent alimentum et augmentum, ut in fine primi dictum est, principium est vitae, ideo hic quasi exemplariter exposuit "habens vitam," id quod habet alimentum et augmentum. Propria autem ratio vitae est ex hoc, quod aliquid est natum movere seipsum, large accipiendo motum, prout etiam intellectualis operatio motus quidam dicitur. Ea enim sine vita esse dicimus, quae ab exteriori tantum principio moveri possunt.**
or operation that is itself as end. With regard to the first type, this motion may be considered as received and in this respect is motion in the strict sense, the act of that which is in potency and in so far as it is in potency. This type of motion is called actus imperfecti; such motion is successive and in time. Correlative to this "perfection" (actus) which belongs to that which exists in potency, is that motion which is produced by that which is actual. This latter is transient action. As we saw before, although this action proceeds from a being which is in act, it is the perfection of another and so is identified with the

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2 St. Thomas, S. Th., I, 18, 1 c: Ex quo patet quod illa pro-prie sunt viventia, quae seipsa secundum aliquam speciem motus mo-vent; sive accipiatur motus proprie, sicut motus dicitur actus im-perfecti, id est existentis in potentia; sive motus accipiatur communiter, prout motus dicitur etiam actus perfecti; prout intel-ligere et sentire dicuntur moveri, ut dicitur (De Anima); ut sic viventia dicantur quaecumque se agunt ad motum, vel operationem aliquam. Ea vero in quorum natura non est ut se agant ad aliquem motum vel operationem, viventia dicit non possunt, nisi per aliquam similitudinem.

3 St. Thomas, S. Th., I-II, 31, 2 ad 1: Motus duplicitus dicitur; uno modo, qui est actus imperfecti, scilicet existentis in potentia, inquantum huiusmodi; et talis motus est successivus et in tempore. See also In IV Sent. d. 17, 5, 3 ad 1: Ad primum ergo dicendum, quod motus duplicitus dicitur, ut patet in 3 De Anima (text. com. 28). Est enim quidam motus qui est actus Im-perfecti, qui est exitus de potentia in actum; et talis oportet quod sit successivus, quia semper expectat aliquid in futurum ad perfectionem suae speciei, eo quod pars motus est alterius speciei a toto motu, ut dicitur in 10 Eth. (cap. 2 vel 4).

4 St. Thomas, S. Th., I, 53, 1 ad 2: Ad secundum dicendum, quod motus existentis in potentia est actus imperfecti. Sed motus qui est secundum applicationem virtutis, est existentis in actu, quia virtus rei est secundum quod actus est.
first type of motion; their distinction is one of source and recipient. In contrast to these two "motions" is that "motion" which is a perfection of the one acting, not, however, in so far as the one acting is potential in some way; but precisely as the one acting is in act, is he perfected by this type of motion. This motion is the \textit{actus perfecti}; it is non-successive and of itself is not in time. Such are the activities of sensing and understanding.\footnote{St. Thomas, \textit{In IV Sent.}, 17, 5, 3 ad 1: \textit{Alius motus est actus perfecti, qui magis operatio dicitur, qui non expectat aliquid in futurum ad complementum suae speciei, sicut sentire; et talis motus non est successivus, sed subitus; et si contingat quod talis motus sit in tempore, hoc orit per accidens, quia mensuratur in quolibet instanti illius temporis in quo dicitur esse...} Thus, that which is no way is tending to perfection, but is ultimate perfection, is entirely without motion; this is God. \textit{In II Sent.}, 11, 2, 1 c: \textit{Respondeo dicendum quod secundum Philosophum, operatio et motus differunt: operatio enim est actus perfecti, ut lucidi lucere, et intellectus in actu, intelligere; sed motus est actus imperfecti tendentis in perfectionem; et ideo id quod est in sua ultima perfectione, habet operationem sine motu, sicut Deus; quod autem distat ab ultima perfectione, habet operationem conjunctam motui...}
exists in act. 6 Since, however, the form of a thing is the principle of its actions, and it is by the form that the thing is in act and acts, when we say that immanent action is the act of the perfect, this is not to be understood only in a causal sense.

Such an understanding would merely show how it differs from motion in the strict sense. This understanding, however, does not show its distinction from transient action; for all actions proceed from a being in act and in so far as it is in act. 7 Rather, "act of the perfect" must also be understood formally; that is, not only is it an act of a principle that has been perfected, but it is, even more, a perfection in the formal sense of that agent itself in the very respect in which that agent is in act. 8 It is

6St. Thomas, S. Th., I, 18, 3 ad 1: Quarum haec est differentia, quia prima actio non est perfectio agentis, quod movet, sed ipsius moti; secunda autem actio, est perfectio agentis. Unde, quia motus est actus mobilis, secunda actio, in quantum est actus operantis, dicitur motus eius ex hac similitudine, quod, sicut motus est actus mobilis, ita huiusmodi actio est actus agentis; licet motus sit actus imperfecti scilicet existentis in potentia, huiusmodi autem actio sit actus perfecti, id est, existentis in actu.

7St. Thomas, Quaest. Disp. de Veritate, 8, 6 c: Hae autem duae actiones in hoc conventunt quod utraque non progreditur nisi ab existente in actu, secundum quod est actu....

8A. Laurent, "De Natura Actionis Immanentis Secundum S. Thomam," Divus Thomas (Piacenza) vol. 41 (1938) p. 235: Unde quando dicitur actionem immanentem esse actum perfecti, hoc non debet intelligi causaliter tantum (sic enim solummodo ostendum eius differentia a motu proprie dicto), sed debet intelligi formaliter, scilicet: est actus non tantum alicuius principii quod iam est perfectum, sed est formaliter perfectio ipsius agentis ut lucere est perfectio lucidi. And on p. 236: Unde talis actio quae proprie operatio vocatur, jure dicitur formaliter actus perfecti.
such an action — an immanent action — which is properly called "operation." This is formally the actus perfecti.

Now, since it is evident that acts of sensing and understanding (in man) are successive and in time, what can be the meaning of St. Thomas when he characterizes the actus perfecti as non-temporal? To understand this, let us first consider Aristotle's distinction between actuality and movement as it appears in the Metaphysics: ⁹

Since of the actions which have a limit none is an end but all are relative to the end, e.g., the removing of fat or fat-removal, and the bodily parts themselves when one is making them thin are in movement in this way (i.e., without being already that at which the movement aims), this is not an action or at least not a complete one (for it is not an end); but that movement in which the end is present is an action. E.g., at the same time we are seeing and have seen, are understanding and have understood, are thinking and have thought (while it is not true that at the same time we are learning and have learnt, or are being cured and have been cured). At the same time we are living well and have lived well, and are happy and have been happy. If not, the process would have had sometime to cease, as the process of making thin ceases: but, as things are, it does not cease; we are living and have lived. Of these processes, then, we must call the one set movements, and the other actualities.

In this text, Aristotle points out that actions are to be distinguished as those which are ends in themselves and those which are relative to ends. Those which in themselves are ends, those which represent in themselves an actuality are different than those which are processes to something; this is a distinction

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⁹ Aristotle, Meta., 1048b18-28. Translations of the Metaphysics are from W. D. Ross.
which suggests St. Thomas' distinction in esse and in fieri. 

Every "movement" is incomplete; every "actuality" is complete. There is a distinction as part from part between that which is being moved from that which is moved; but on the other hand, it is one and the same thing at the same time that sees and has seen. 10 (St. Thomas agrees with Aristotle in his commentary on this text. 11) In this sense, then, are sensing and understanding non-temporal: the act itself admits no before and after. The important distinction to be made in this regard is that movement may accompany operation (or "actuality") but is something distinct from it.

In every created thing, the essence differs from its esse and is compared to it as potency to act. But the act to

10 Ibid., 1048b29-34: For every movement is incomplete -- making thing, learning, walking, building; these are movements, and incomplete at that. For it is not true that at the same time a thing is walking and has walked, or is building and has built, or is coming to be and has come to be, or is being moved and has been moved, but what is being moved is different from what has been moved, and what is moving from what has moved. But it is the same thing that at the same time has seen and is seeing, or is thinking and has thought. The latter sort of process, then, I call an actuality, and the former a movement.

11 St. Thomas, In IX Meta., lect. 3, #1862: Quia enim dixerat, quod opus est finis, posset aliquis credere, quod hoc esset verum in omnibus. Sed ipse hoc remotet, dicens, quod quorum dam activarum potentiarum ultimus finis est solus usus potentiae, et non aliquum operatum per actionem potentiae; sicut ultimus finis potentiae visivae est visio, et praeter eam non fit a potentia visiva aliquod opus operatum.
which is compared the operative potency is operation. Since a creature is not its own act of sensing or act of understanding, it is not its own sense or intellective power. (Intelligence is a power whose act is immanent, as we saw above, and whose act is of the perfect[ed], as we shall see.) "In this instance the act of the potency -- that is the act by which it is put in act -- is followed by an action that is intrinsic to the being. This is the key to the meaning of actus perfecti." St. Thomas, in his commentary on the De Anima, points out that the operation referred to in sensation, is the act of the sense which had already been made in act through the sensible species. Motion, then, applied to the act of sensing (or understanding) is different than physical motion.

12St. Thomas, S. Th., I, 54, 3 c: In omni autem creato essentia differt a suo esse et comparatur ad ipsum sicut potentia ad actum. Actus autem ad quem comparatur potentia operativa est operatio.


14St. Thomas, In III De Anima, lect. 12: Et quia omne, quod est in potentia, inquantum hujusmodi, est imperfectum ideo ille motus est actus imperfecti. Sed iste motus est actus perfecti: est enim operatio sensus jam facti in actu, per suam speciem. Non enim sentire convenit sensui nisi in actu existenti; et ideo iste motos [sic] simpliciter est alter a motu physico. Et hujusmodi motus dicitur proprie operatio, ut sentire et intelligere et velle. Et secundum hunc motum anima movet seipsam.
Sense or intellect therefore, is said to undergo change, or to suffer only in this way that there is a reception of species; \textsuperscript{15} but "with respect to the act following the sense or intellect perfected by species" there is no \textit{passio} or \textit{motus} but only the \textit{actus perfecti}. \textsuperscript{16} The passive element in immanent activities, then, pertains to the reception of a perfection or specification by formal object that is the principle of the activity, but not the ac-

\textsuperscript{15} Even this is not a proper use of \textit{pati} says St. Thomas, \textit{In III Sent.}, d. 15, 2, 1, qst. 11, c.: \textit{Sed quia potentiae apprehensivae sensitivae sunt tantum in recipiendo speciem, quae quidem non recipitur in sensu per modum rei, sed per modum intentionis; ideo in operatione harum vivium est quidem aliquo modo pati, quantum ad hoc quod sunt vires materiales, et quantum ad hoc quod aliquid recipitur (et propter hoc dicitur in 2 de Anima text. 52, quod sentire est quoddam pati). Sed quia sensus non movetur a sensibili secundum conditionem moventis, cum forma sensibilis non recipiatur in sensu secundum esse materiale prout est in sensibili, sed secundum esse spirituale, quod est proprium sensui (unde non habet contrarietatem ad sensum, sed est perfectio eius, nisi secundum quod excedit proportionem sensus); ideo non proprie dicitur pati, nisi secundum quod excellentia sensibilium corrum-pit sensum, aut debilitat.}

\textsuperscript{16} St. Thomas, \textit{In I Sent.}, 40, 1, 1 ad 1: \textit{Operatio semper est perfecti, ut patet in sensu: sentire enim est quaedam operatio sentientis, nec procedens in effectum aliquem circa sensibile, sed magis secundum quod species sensibilis in ipso est; unde sentire quantum ad ipsum receptionem speciei sensibilis nominat passionem, similiter et intelligere quod etiam pati quoddam est, ut in 3 De Anima (text. 2) dicitur: Sed quantum ad actum consequentem ipsum sensum perfectum per speciem nominat operationem, quae dicitur motus sensus, de quo dicit Philosophus (in 3 De Anima, text. 11) quod est \textit{actus perfecti}.}
tivity itself.\textsuperscript{17} Such a specification or reduction from potency to act is characteristic only of beings that in some way are in potency and are not pure act. Having been put into act, there is no longer a question of a transition from potency to act; rather, it is the development of a perfection already possessed, an increase in actuality.\textsuperscript{18} Father Laurent calls it a superabundantia

\textsuperscript{17}G. P. Klubertanz, S.J., \textit{The Philosophy of Human Nature}, pp. 90-91, has this to say about the passivity of immanent operation: Inasmuch as some immanent operations involve the reception of an act, perfection, or form, and all immanent operations are specified by their objects as by a formal principle, they can be called passive. But ... the passion correlative to a transient action is the reception of a perfection from an agent, in place of a perfection formerly possessed. The passive immanent operation (as far as the immediate efficient or eliciting cause is concerned) is from the patient itself; the specification from the object does not of itself imply efficient causality; and when the object has acted efficiently upon the patient the reception does not involve the loss of a perfection formerly possessed. ... In our experience, every passive immanent operation actually implies a prior reception of a perfection. A "pure" immanent operation would be passive only in the sense of being specified by its object. This pure immanence is partly exemplified in the intuitive self-knowledge of the angels, and entirely exemplified in the Divine knowledge.

\textsuperscript{18}St. Thomas exemplifies by way of knowledge, \textit{In II De Anima}, lect. 11, \#367: Manifestat [Aristoteles] utrum quod educitur de potentia in actum scientiae patiatur. Et primo manifestat hoc circa id quod educitur de secunda potentia in actum purum. Secundo autem manifestat hoc circa id quod educitur de potentia prima in habitum. ... Dicit ergo primo, quod habens scientiam, id est habitualiter sciens, fit activus speculans. Sed hoc aut non est et proprie alterari et pati; quia, ut dictum est, non est proprie passio et alteratio, cum de potentia procedit in actum, sed cum aliquid de contrario mutatur in contrarium. Cum autem habitualiter sciens, fit speculans actu, non mutatur de contrario in contrarium, sed proficit in eo quod jam habet. Et hoc est quod dicit quod "est additio in ipsum, et in actum." Additur enim ei perfectionem secundum quod proficit in actum.
With respect to the principle of the activity, then, a living thing may be said to be moved to act in that respect in which its living-powers are potencies distinct from its substance: but this motion is not the actus perfecti, the immanent action proper to life. Rather, once put into act, the living-power acts with an increase of actuality: the (further) perfection of that which has been perfected. This activity, then, a simple perfection, is the actus perfecti, applicable even to God -- with the qualification, of course, that His vital activity has no need to be put into act.  

With respect to the term of the activity, St. Thomas points out that we expect "operation" to produce something. This product or term of the activity either remains within the agent or is produced outside of it. But the fact that a product remains within the agent is not the reason for calling the operation immanent.


20 Laurent lists four characteristics of immanent action (pp. 238-239): 1) Est perfectio agentis secunda; 2) est perfectio simplex (potest inveniri formaliter in Deo et potest identificari cum esse agentis); 3) necessario requirit aliquam immaterialitatem quia aliquomodo det agenti perfectiones aliarum rerum; 4) est duplicis generis, cognitio et appetitio.

21 St. Thomas, Quaest. Disp. de Veritate, 4, 2 c: ... sicut hoc nomen operatio, quae procul dubio importat aliquid procedens ab operante: tamen iste processus non est nisi secundum rationem tantum.
Whether or not something is produced within or outside of the agent, this, too, like the need for a principle of action, is per accidens to the activity itself. ②

Having distinguished motion and activity, let us now see why self-motion is improperly said of immanent activity. First, we are able to make this distinction: "to live is to be moved by oneself" expresses the autonomy of vital activity, while "to live is to move oneself" expresses the immanence of that activity. ③

In both cases, however, as we have seen, self-movement requires some sort of heterogeneity on the part of the agent so that it will be both agent and patient in different respects. Therefore, an agent that in the strict sense is able to move itself would be alive; but it would not be perfectly simple and thus would include the imperfection of motion in the strict sense. Hammond points this out in commenting on Aristotle: ④

②Laurent, p. 237: [Immanentia] termini omnino per accidens se habere ad operationem ipsam in ratione operationis. Quod enim operatio producat aliquid sive extra sive intra subjectum agens, non, ex hoc est perfectio agentis prout est agens, sed potius prout simul est patient.

③M. Fatta, "La Transcendenza della Vita," Bolletino Filosofico, vol. IV, p. 324: Vivere è 'movere a se ipso': sotto quest' angolo visuale è l'autonomia dell'attività che risalta; vivere è 'movere se ipsum': sotto quest'altro angolo visuale è l'immanenza che risalta.

Everything that moves itself contains a duality of moving principle and thing moved.... Every living thing, a plant no less than a man is a composite being (σώματος), viz. a composite of soul and body. The soul is the cause of motion and change, and is therefore the 'efficient cause'; it is further that which determines the form or individuality of the organism, and is therefore the 'formal cause'; it is also the end for which the body exists, and is, for that reason, the 'final cause.'

And Aristotle himself points out that:

For, unless I am mistaken, the definition of soul as the self-moving, or as that which is capable of self-motion, misrepresents its essential nature; nay, more; it is quite impossible for soul to have the attribute of motion at all.25

Any motions in the living thing pertain to the whole being that happens also to be a material living thing.26 Further, St. Thomas points out that metaphorically even God could be said to


26 Ibid., 408b1-15: The soul is said to feel pain and, joy, confidence and fear, and again to be angry, to perceive and to think; and all these states are held to be movements: which might lead one to infer that soul itself is moved. But this is no necessary inference. ...[For even to suppose that all these are movements] doubtless it would be better not to say that the soul pities or learns or thinks, but that the man does so with the soul: and this, too, not in the sense that the motion occurs in the soul, but in the sense that motion sometimes reaches to, sometimes starts from, the soul. (And St. Thomas agrees in S. Th., I-II, 22, 1 ad 2: Ad secundum dicendum, quod pati et moveri etsi non conveniat animae per se, convenit tamen ei per accidens, ut in I De Anima dicitur.)
move Himself in so far as He loves Himself.\textsuperscript{27} The point to be stressed here, then, is that in its proper sense, life does not mean self-movement; nor is self-movement equivalent to immanent activity. This is true even though life and a principle of immanent operation are necessary as the agent in self-movement. Further, as we saw in chapter three, the most immanent of vital activities is the act of understanding. We will, therefore, discuss a few aspects of understanding as perfect life.

\textbf{LIFE PAR EXCELLENCE.} Understanding is the perfect immanent action because it neither depends on prior movements nor is involved \textit{per se} with external qualifications. This non-dependence on movement is to be taken as referring to the very act of understanding. To become perfect through an intelligible species belongs to that intellect that is sometimes in potency; but the divine intellect is in no way in potency, needs no intelligible species to actuate It, and is Its own perfection and own act of

\textsuperscript{27}St. Thomas, \textit{In I Sent.}, 45, 1, 1 ad 3: Ad tertium dicendum quod voluntas non \textit{movetur nisi a fine; finis autem voluntatis divinae est ipsa sua bonitas quae est idem quod voluntas secundum rem; et ideo non sequitur quod Deus sit movens motum, proprie loquendo, quia omne movens est aliud a moto. Sed forte propter hoc Plato posuit quod primum movens seipsum movet, inquantum cognoscit se et amat se \ldots et hoc non nisi metaphorice dicitur, sicut etiam dicitur quod finis movet.
Aristotle points out that actually life according to reason for man is the presence of something divine in him; and yet he advises us to follow such a life according to reason, transcending merely mortal things. But this life, he continues, does not really transcend man; rather it is the better part of him. And man should strive to live according to his better part. "Reason more than anything else is man." In his commentary, St. Thomas

28St. Thomas, S. Th., I, 14, 2 ad 2: Non enim intelligere est motus, qui est actus imperfecti, qui est ab alio in alium; sed actus perfecti existens in ipso agente. Similiter etiam quod intellectus perficiatur ab intelligibili, vel assimilatur ei, hoc convenit intellectui qui quandoque est in potentia; quia per hoc quod est in potentia, differt ab intelligibili, et assimilatur ei per speciem intelligibilem, quae est similitudo rei intellectae, et perficitur per ipsam, sicut potentia per actum. Sed intellectus divinus, qui nullo modo est in potentia, non perficitur per intelligibilem, neque assimilatur ei, sed est sua perfectio et suum intelligere.

29Aristotle, Eth. Nich., 1177b30-1178a3: If reason is divine, then, in comparison with man, the life according to it is divine in comparison with human life. But we must not follow those who advise us, being men, to think of human things, and, being mortal, of mortal things, but must, so far as we can, make ourselves immortal, and strain every nerve to live in accordance with the best thing in us; for even if it be small in bulk, much more does it in power and worth surpass everything. This would seem, too, to be each man himself, since it is the authoritative and better part of him. It would be strange, then, if he were to choose not the life of his self but that of something else. And what we said before (1169b33, 1176b26) will apply now; that which is proper to each thing is by nature best and most pleasant for each thing; for man, therefore, the life according to reason is best and pleasantest, since reason more than anything else is man. This life therefore is also the happiest. (This is Ross' translation.)
For that which is best in each one according to nature is most proper for him. But it follows from being best and proper that it be most desirable, because each one delights in the good that belongs to him. Therefore, it is evident that if man is most properly intellect as the most important [power] he has, then the life which is according to intellect is most desirable for man, and most proper to him. Nor is this contrary to what was said above about this life being not on the level of man, but above him. For it is not on the level of man in so far as he is a composite nature; but it is most proper to him on the level of that which is most important in him. This type of life, it is true, is found most perfectly in higher substances; in man it is found imperfectly and as if participated. Yet, this little is greater than all else in man.

Reasoning processes and sensible beginnings of knowledge are proper to understanding as man shares in it; but, as we have seen, these belong to man because of the potential aspects of his nature. If it were possible to grasp in a single intuition all the conclusions contained in known principles, there would be no dis-

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30St. Thomas, In X Eth. ad Nic., lect. XI: Illud enim quod est optimum secundum naturam in unoquoque est maxime proprium sibi: quod autem est optimum et proprium, consequens est quod sit delectabilissimum, quia unusquisque delectatur in bono sibi convenienti. Sic ergo patet, quod si homo maxime est intellectus tamquam principalissimum in ipso, quod vita quae est secundum intellectum est delectabilissima homini, et maxime sibi propria. Nec hoc est contra id quod supra dictum est, quod non est secundum hominem, sed supra hominem: non est enim secundum hominem quantum ad naturam compositam, est autem propriissime secundum hominem quantum ad id quod est principalissimum in homine: quod quidem perfectissime inventur in substantiis superioribus, in homine autem imperfecte et quasi participative. Et tamen istud parvum est magis omnibus aliis quae in homine sunt.
But as it is for man, there is a two-fold process in man’s knowledge: one is successive, wherein after we understand one thing, we turn our attention to something else; the other is the reasoning process from principle to conclusion. "Man is indeed like the angels in mind and intellect, but he differs in his mode of understanding."

Man, then, possesses two types of vital activities: the one, in a sense exterior and in accord with his sensible, bodily nature; the other, in which there is real communication with God and

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31 St. Thomas, S. Th., I, 58, 3 c: Sic igitur et inferiores intellectus, scilicet hominum, per quendam motum et discursum intellectualis operationis perfectionem in cognitione veritatis adipsicuntur dum scilicet ex uno cognito in alium cognitum procedunt. Si autem statim in ipsa cognitione principii noti insipierent quasi notas omnem conclusiones consequentes, in eis discursus locum non haberet.

32 St. Thomas, S. Th., I, 14, 7 c: In scientia enim nostra duplex est discursus: unus secundum successionem tantum; sicut cum, postquam intelligimus aliquid in actu, convertimus nos ad intelligendum alium; alius discursus est secundum causalitatem; sicut cum per principia pervenimus in cognitionem conclusionum.

33 St. Thomas, S. Th., I-II, 89, 4 ad 1: Homo convenit quidem cum angelis in mente sive in intellectu; sed differit in modo intelligendi.... See also S. Th., I, 59, 1 ad 1: Sed intellectus et ratio differunt quantum ad modum cognoscendi: quia scilicet intellectus cognoscit simplici intuitu, ratio vero discurrando de uno in aliud. Sed tamen ratio per discursum pervenit ad cognoscendum illud quod intellectus sine discursu cognoscit, scilicet universale.
the angels. Consider this remarkable text from the *Metaphysics* of Aristotle:

And thinking in itself deals with that which is best in itself, and that which is thinking in the fullest sense with that which is best in the fullest sense. And thought thinks on itself because it shares the nature of the object of thought; for it becomes an object of thought in coming into contact with and thinking its objects, so that thought and the object of thought are the same. For that which is capable of receiving the object of thought, i.e., the essence, is thought. But it is active when it possesses this object. Therefore the possession rather than the receptivity is the divine element which thought seems to contain, and the act of contemplation is what is most pleasant and best. If, then, God is always in that state in which we sometimes are, this compels our wonder; and if in a better, this compels it yet more. And God is in a better state. And life also belongs to God; for the actuality of thought is life, and God is that actuality; and God's self-dependent actuality is life most good and eternal. We say therefore that God is a living being, eternal, most good, so that life and duration continuous and eternal belong to God; for this is God.

It is the possession rather than the receptivity that is the divine element in thought; it is the act of contemplation which is the most pleasurable, best, and highest type of life. The actuality of thought is life -- and so God is most truly alive. This is an interesting conclusion, indeed: there is no life that involves a higher level of activity than contemplation. Usually we con-

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34St. Thomas, *S. Th.*, II-II, 23, 1 ad 1: *Ad primum ergo dicendum, quod duplex est hominis vita: una quidem exterior secundum naturam sensibilem et corporalem, et secundum hanc vitam non est nobis communicatio vel conversatio cum Deo et angelis: alia autem est vita hominis spiritualis secundum mentem; et secundum hanc vitam est nobis conversatio et cum Deo et cum angelis.

trast the active and the contemplative life. And yet, we now see that the fullest measure of activity is found in contemplation. "Active life" means life of notions, human actions, and passions directed by the practical intellect; but our full happiness (in the next life) is to be found in contemplation, while imperfect happiness (in this life) is to be found principally in contemplation and secondarily in other activities.\(^{36}\)

**LIFE AS OPERATION.** Life is said of living things in two ways: either to signify the very \textit{esse} of the living thing, or to signify its operations.\(^{37}\) With respect to the second way life is predicated, Aristotle says:\(^{38}\)

Now life is defined in the case of animals by the power of perception, in that of man by the power of perception or thought; and a power is defined by reference to the corresponding activity, which is the essential thing; therefore life seems to be essentially the act of perceiving or thinking.

\(^{36}\)St. Thomas, \textit{S. Th.}, I-II, 3, 5 c: Tertio idem apparat [quod beatitudo magis consistit in operatione speculativi intellectus quam practic] ex hoc quod in vita contemplativa homo communicat cum superioribus, scilicet cum Deo et angelis, quibus per beatitudinem assimilatur; sed in his quae pertinent ad vitam activam, etiam alia animalia cum homine aliquidem communicant, licet imperfecte.

\(^{37}\)St. Thomas, \textit{In I Sent.}, 8, 5, 3 ad 3: Ad tertium dicendum quod vivere in animali dicitur duplicitur: uno modo vivere est ipsum esse viventis, sicut dicit Philosophus (2 De Anima, text. 37): Vivere viventibus est esse; et hoc modo anima immediate facit vivere quamlibet partem corporis, inquantum est eius forma; alio modo dicitur vivere pro operatione animae.

In this sense of the term, life means everything we have discussed thus far. For, our method has been an analysis of activity; and our conclusion has been an understanding of what it means to say that life is the principle of immanent activity. This is to define life in terms of vital operations. Thus, to sense is said to be the life of animals and to understand, the life of men. In this meaning, life is taken for that operation towards which the whole individual is especially orientated; in this sense, too, life is seen as the perfection of a potency, activity with respect to a vital power.39 On the other hand, the terms "to sense" and "to understand" are not used merely to refer to the operations of the one sensing or understanding; rather, they more properly refer to the esse of the living thing, in such a way as to mean one having the nature to sense or to understand.40

LIFE AS SUBSTANTIAL. In its fullest sense, life is an es-

39St. Thomas, In IV Sent., d. 49, 1, 2, qst. 3 c: Cuiuslibet autem potentiae perfectio est suus actus: unde secundo translationem est nomen vitae ad significandum operationem ad quam aliquis seipsum movet, sicut sentire dicitur vita animalis, et intelligere vita hominis: et secundum hunc modum unusquisque illum operationem suam vitam reputat cui maxime intendit, quasi ad hoc sit tum esse suum ordinatum.

40St. Thomas, S. Th., I, 18, 2 ad 1: Ad primum ergo dicendum, quod Philosophus Ibi accipit vivere pro operatione vitae. Vel dicendum est melius, quod sentire et intelligere, et hujusmodi, quandoque sumuntur pro quibusdam operationibus; quandoque autem pro ipso esse sic operantium. Dicitur enim, quod vivere est sentire vel intelligere; id est habere naturam ad sentiendum vel intelligendum.
sentential predicate. \( ^{41} \) St. Thomas explains that the name \textit{life} is taken from certain observable features about a thing, namely, that it moves itself. But the name is given not to signify that self-movement, but to signify the substance whose power it is to move itself to activity:

And in this respect to live is nothing else than to be (esse) in such a nature; and \textit{life} signifies this very same thing, but in an abstract way. This is like the name \textit{running} which signifies the very act of to run, but abstractly. Therefore, \textit{life} is not an accidental, but a substantial predicate. Sometimes, however, \textit{life} is taken less properly for the operations of life, from which the name itself is taken. \( ^{42} \)

"To live" is to be in such a nature; and "life" signifies this very thing, but in an abstract way. What does this mean in the light of our investigation?

Having discovered that an actual principle, a form, is the source of all, including vital, activities, we must now ask

\[ ^{41} \text{St. Thomas, S. Th., III, 50, 5 c: Cum vita sit aliquid de essentia corporis viventis, est enim praedicatum essentiale, non accidentale; unde consequens est quod corpus quod desinit esse vivum, non totaliter idem remaneat.} \]

\[ ^{42} \text{St. Thomas, S. Th., I, 18, 2 c: Sic ergo dicendum est et de vita. Nam vitae nomen sumitur ex quodam exterius apparenti circa rem, quod est movere seipsum: non tamen est impositum hoc nomen ad hoc significandum, sed ad significandum substantiam cui convenit secundum suam naturam movere seipsum, vel agere se quocumque modo ad operationem. Et secundum hoc vivere nihil aliud est quam esse in tali nature; et vita significat hoc ipsum, sed in abstracto; sicut hoc nomen, cursus, significat ipsum currere in abstracto. Unde vivum non est praedicamentum accidentale, sed substantialia. Quandoque tamen vita sumitur minus proprie pro operationibus vitae, a quibus nomen vitae assumitur.} \]
whether this form is the ultimate source of vital activities or whether there is some principle actualizing even form. As we have seen in chapter one, there is such a principle: esse, the act of existing. The act of existing, then, which is proper to a being, is the ultimate source of the vital (and other) activities of that being in so far as it existentializes the activities as well as the nature from which the activities come. Esse itself is the dynamism of the being; it is to such an extent activity that only a verb properly expresses it. A verb — a word signifying action — must be used to point to this continuity of "doing-something." This activity, however, may take many different modes in different beings; but each type of activity is properly expressed by a verb, which expresses an aspect of the act of existing itself. Thus it is that the act of living is the act of existing which a living thing has, and "to live is to be for living things."

To live, then, is to be with the type of existence given by a certain form. Life signifies the very same existence, but differs as an abstract term differs from a concrete. Vivere signifies the activity of life as it is this life; vita abstracts from the one who lives. Thus, to live is just as analogous as esse. This analogy is really two-fold. To live, as applied to God and to creatures, is said analogously: in God, to live is identified with His esse; in creatures, to live is the esse which is given
by a certain form and thus has the character of principle. To 
live as applied only to creatures, is also said analogously; but 
it is said of each in the same way in one respect, as a principle 
of their being.

To conclude, then:

1. There can be no one essential definition of life, even 
taken abstractly. Life is analogous and is applied to each being 
in the way it is found there. There are, of course, certain logi-
cal classifications of living things; but to "classify" means to 
"leave out." And there is nothing in a living thing to which to 
live does not pertain, as also with esse.

2. We are able to characterize, in terms of the metaphysi-
cal definition discussed in chapter one, the main aspect of vivere 
which has analogous application in different living things. For, 
again, vivere is to be "defined" just as (analogously) as esse is 
"defined": esse is that whereby an essence actually exists, tak-
ing essence in the wide sense to include accidents.

3. Thus, to live is that perfection whereby all the other 
perfections of a potentially living thing are so actualized that

43St. Thomas, Contra Gentes, I, c. 98: Vita enim viventis 
est ipsum vivere in quadem abstractione significatum; sicut cur-
sus, secundum rem, non est aliud quam currere. Vivere autem 
viventium est ipsum esse eorum, ut patet per Philosophum (De 
Anima, II, text. comm. 75): cum enim ex hoc animal dicatur 
vivens, quod animam habet, secundum quam habet esse utpote secun-
dum propriam formam, oportet quod vivere nihil sit aliud quam 
tale esse ex tali forma proveniens. Deus autem est suum esse, ut 
supra (c. 22) probatum est. Est ergo suum vivere et sua vita.
such a being is able to elicit motions and operations that are in some way of itself.

4. Of course, such terms as "potentially living" are applied to God after our manner of dividing what is simple so that we may understand it. Thus, the essence of God is thought of as distinct from His existence, by a distinction of reason only. This difficulty only points up the greater difficulty of including both God and creatures under one "definition" of life.

5. Life, then, in its proper sense, is a metaphysical principle of being, nothing else than the esse, the act of existing a living thing has. In a less proper sense, life is the vital activity of a living thing, or the source of that activity. In either case, life represents what is actual in a thing; as such, its nature transcends matter and is applicable to God Himself.
BIBLIOGRAPHY

I. PRIMARY SOURCES


-----. De Anima. Edited by R. D. Hicks. Cambridge University Press, 1907.


St. Thomas Aquinas. Opera Omnia. Parmae, 1862-1870, 25 vols. (Piana edition); photostatic reproduction, New York, Musurgia, 1948-1950. From this collection I have used the following:

-----. In X Ethicorum ad Nichomachum Libros Commentaria, vol. 21.

-----. In VIII Physicorum Libros Commentaria, vol. 19.

-----. In III De Anima Libros Commentaria, vol. 20.

-----. Super Sententias Magistri Petri Lombardi Scriptum, vols. 6 and 7.

-----. Quaestio Disputata de Anima, vol. 8.

-----. Quaestiones Disputatae de Potentia, vol. 8.

-----. Quaestiones Disputatae de Veritate, vol. 9.

Separate editions:

St. Thomas Aquinas. *Aristotle's de Anima ... and the Commentary of St. Thomas Aquinas.* Translated by Foster and Humphries. Yale, New Haven, 1951.


----- *Opusculum de Ente et Essentia.* Marietti, Turin, 1935.

----- *Quaestiones Disputatae de Veritate.* Marietti, Turin, 1949.


II. SECONDARY SOURCES

A. **Commentaries on Aristotle.**


B. **Commentaries on St. Thomas.**

Barberis, A., "De his quae pertinent ad potentias animae in generali - Commentaria in Quaest. LXXVII, S. Th.," *Divus Thomas (Piacenza)* vol. 1, 1880.


John of St. Thomas, **Cursus Philosophicus**, 3 vols., Marietti, 1937.


C. "Thomistic" approaches.

(Sheed and Ward).


D. Others.


E. A final section is added comprising works that were consulted because dealing with certain phases of this problem, but not used as references for various reasons.


Pegis, Anton C., St. Thomas and the Problem of the Soul in the Thirteenth Century. Toronto, 1934.


The thesis submitted by Francis Joseph Catania has been read and approved by three members of the Department of Philosophy.

The final copies have been examined by the director of the thesis and the signature which appears below verifies the fact that any necessary changes have been incorporated, and that the thesis is now given final approval with reference to content, form, and mechanical accuracy.

The thesis is therefore accepted in partial fulfillment of the requirements for the Degree of Master of Arts.

Sept 13, 1957
Date

Signature of Adviser