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ANALOGON AND *ANALOGIA* IN THE PHILOSOPHY OF ARISTOTLE

WE DO NOT wish to give an exhaustive treatment of the problem of *analogue* and *analogy* in the philosophy of Aristotle, for then we would have to analyze his entire work under this special aspect. We seek only to specify a few elements of this problem, one which is especially important whenever we try to penetrate the philosophical genius of Aristotle, since it may well be that his manner of using analogue and analogy best characterizes his philosophical approach.

If Plato is above all the philosopher of dialectics, Aristotle is the philosopher engaged in the search for proper and first causes. If they both use analogy, they employ it in very different ways. In fact, we are in the presence of two major methods for the use of analogy: the first remains fully orientated to dialectics, the second serves the most perfect understanding possible concerning *what is;* the first remains an

analogy of form, the second attains being, *that which is.* To Plato, as to Aristotle, analogy is indeed a method for excellence, a method which allows us to rediscover a more profound unity through the diversity as it first appears to us; yet this type of excellence functions quite differently in each of them.

There are relatively few texts in which Aristotle explicitly speaks of analogy or the analogue, and even fewer in which he explains his understanding of these words. However, if we go beyond the strictly literal and try to penetrate the thought of the Philosopher, we are pleasantly surprised to see that his philosophical inquiries, which go beyond merely univocal knowledge attained through genus and specific difference, are truly pursued at another level, which can easily be characterized as *analogical.* Does not this exaction result from the Philosopher's desire to grasp, in everything he analyzes, not only the material and quantitative aspect but especially the most qualitative and most real aspect, discerned in the final cause? The latter escapes from the confines of every vocal systematization of knowledge. If the continued inquiry into the various causalities, and especially finality, gives the philosophy of Aristotle its incomparable and excellent value, this is also the quality which often makes it incomprehensible to minds formed under fully different disciplines. This is why we feel it is important to approach this problem of *analogon* and *analogia* in the philosophy of Aristotle for its own sake and to try to unfold all its richness.[1]

In the first section we should like to extract the principal texts in which Aristotle explicitly speaks of analogy or analogue and to try to specify their proper meaning.

In the second part, beginning with the Philosopher's major statements on the subject of " terms having manifold mean-

[1] Cf. G. L. Muskins, *De voci<l dvctXo-ylct significatione ac non apud Aristotelem,* thesis of the University of Nijmegen, Groningen, 1948: H. Lyttkens, *The Analogy between God and the World* (Upsala, 1952), pp. 29-77. One should consult also the latest work on analogy by B. Montagnes, 0. P., *La doctrine de l'analogie de l'etre d'apres Saint Thomas d'Aquin* (Philosophes medievaux, VI) (University of Louvain, 1968), which summarizes the Aristotelian doctrine of analogy within a few pages.

ings," ordered to a same end or proceeding from an identical origin, we shall examine whether such statements disagree with his conception of the analogue and analogy or whether, on the contrary, they are essentially linked to them; this will require an ultra-literal grasp of the proper and fundamental meaning of analogy.

Finally, in the third section, we shall try to show the connections between analogy and the various metaphysical analyses of being, since ultimately analogue and analogy can be explained only through the diversity and the unity of *that which is.*

I. THE PRINCIPAL TEXTS IN WHICH ARISTOTLE MENTIONS ANALOGY AND ANALOGUE

In order to respect the various levels of Aristotle's philosophical reflection-and we deem this to be particularly important whenever analogy is concerned-we shall follow the Philosopher's various writings, in the attempt to specify any original idea each text expresses relevant to the problem under consideration.

A. *Logical Warks, Rhetoric, Poetics*

In the *Organon* Aristotle rarely uses the terms *analogue* and *analogy*. This is hardly surprising, since logic primarily concerns the univocal universal and the various relations which unite the univocal universals.

Nevertheless, in the *Topics* Aristotle uses the term *avaA.oyov* once. Analogue there expresses a proportion which exists between ends and their efficient causes/ justifying that in certain cases the efficient cause is preferable to the end. He also uses

• Cf. *Topics* III, 1, 116b £7: "Between an agent and an end, preference is taken from the *analogue* when the superiority of one over the other is greater than that of the latter over its own efficient cause.· For instance, if happiness has a greater superiority over health than health over that which produces health, that which produces happiness is better than health." *ITot?!TtKov Ka.I Te"hovs EK 'TOV avaAO')'OIJ, 5Tav* 'IrAElOJ11. *V'Ir<pexu 'TO* TeAOS *'TOV Te"Aovs* il *EKe'ivo 'TOV olKelov 'IrOL?!TtKOv,* ••• (The Latin *J,K 'TOV avaAO')'OV* as *ex p-roportione).*

the expression *Kar' avaA.oyfav* [8] once to signify realities which behave similarly among one another without reference to a subject. The Philosopher distinguishes these realities from the attributes similarly pertinent to the subject. Here, then, " according to analogy" means "similarly" *(of.Lotws),* inasmuch as it qualifies exew and not *1nrapxew.*

These terms occur more frequently in the *Analytics,* especially the *Posterior Analytics* (thirteen times). The analogue expresses a similarity of relations between the fact of not knowing the good and that of knowing the non-good on the one hand, and, on the other, the fact of not being good and of being non-good,4 since knowledge is fully related to its proper object. If, then, the terms of the first relations are different, those of the second will likewise differ. These terms are said to be *analogous,* inasmuch as a certain similarity of relationship exists between them. *Analogue* also expresses that which implies a proportion/ is proportionate, [6] or implies something in common, as having the same source/ such as homonyms having

[3] Cf. *Topics* V, 8, 138b "The place based upon things standing in a similar relation differs from that based upon attributes belonging to the subject in a similar relation, inasmuch as the former is derived by analogy without any consideration of some attribution of the subject ... " *Ata.<f>epet 6'* O *e,, TWP op.olws EXOPTWP TOV fl<: TWP ap.olws V7ra.px6vTWP, 5n TO p.liv Ka.T' ava.Ao"'(la.v Aa.p.f36.veTa.t, OVK* E7rl *TOV V7rapxetv TI Oewpovp.evov.* • • • (The Latin translates *Ka.r' ava.Ao"'(la.v* as *secundum analogiam* or as *ex proportione,* according to the translation of Sylv. Maurus).

• *Prior Analytics* I, 46 5lb "Thus, just as there is no identity between *not knowing the good* and *knowing the non-good,* so there is no identity between *being non-good* and *not being good,* inasmuch as in the matter of these analogous terms (*Twv avaAo"'(ov),* if the first are different, so are the others." (*'AvaAo"'(ov* is translated into Latin as *quae eamdem rationem habent)* .

• *Posterior Anal.* I, 5, 74a 18: *TO avaAO"'(OJI 5n* (The *TO avaAO"'(OJI* is translated into Latin as *proportio).* Cf. II, 17, 99a 8, where we find the same expression.

[6] *Post. Anal.* I, 85a 38: Concerning universal demonstration the Philosopher explains: " In fact, in this type of demonstration, one proceeds in such a way as to attempt proofs like that which asserts that a proportional (1repl *Tov a11Ct.* M"'(oJI) is anything having a certain definite characteristic, and that it is neither a line nor a number nor a solid nor a plane, but something distinct from all of these." (Here *a11Ct. M"'(ov* is translated as *proportionale).*

• *Post. Anal.* II, 14, 98a In reference to generic determination, the Philosopher makes this final specification: " Moreover, there is another method of selec-

a similarity of relations in diversity.[8] The expression *according to analogy* qualifies common principles in order to show the particular character of their universality or realities or their middle-terms. Discussing principles, Aristotle notes that "among the principles used in demonstrative sciences, some are proper to each science and others are common, having that communication which accords with analogy *(Kowa KaT' ava-A.oy[av),* since their use is limited to the genus of the science."[9]

These common principles are said to be common *according to analogy* precisely because, in each case, they are modified in the various sciences which use them, without thereby being limited to any one of these sciences. If their proper meaning cannot be reduced to this or that particular science, their use is limited to the genus of each science using them.

If these common principles have a meaning which cannot be reduced to the restricted sense of one particular genus, this is precisely because these principles are directly based on being, the precise exactions of which are expressed by them. Being, however, does not belong in a genus.[10]

tion, namely, by analogy *(KaTa T0 aval\o'Yov).* It is impossible to find one and the same name to designate pounce, spine, and bone (properly so-called), and yet all these realities have attributes which belong to them as if they were one and the same nature of this type." *(KaTa To aval\o'YoP* is translated as *secundum proportionem).*

[8] Cf. *Post. Anal.* II, 17, 99a U: "The cause of similarity is different for color than for figure because 'similarity' in these cases is equivocal; in the latter it means, presumably, that the sides are proportional and the angles are equal, whereas in colors it means that our perception of them is one and the same or something of that sort." (To *dval\o'YDP* is translated into Latin as *secundum proportionem habere latera, et aequales angulos* . . .).

[9] *Post. Anal.* I, 10, 76a 87-89. *(Kar' aval\o'Ylav* is translated into *secundum analogiam).* The Philosopher explains: "The common principles are propositions such as: If we remove equal portions from equal things, the remaining portions are equal. But the application of each of these common principles is limited to the genus in question, for it will have the same value, even if it is not used in its universality but in geometry, for instance, is applied only to sizes or in arithmetic only to numbers" *(Post. Anal.* I, 10, 76a 41-76b 2). Considering these common principles or axioms, Aristotle again states: "All sciences communicate with one another by common principles. (I call those principles common which are used as premises of a demonstration and not those which are the subject of a demonstration nor that which is demonstrated)" *(Post. Anal.* I, 11, 77a 26-28; cf. also 75b 2).

[10] *Post Anal.* II, 7, 92b 18.

Investigating the connections between cause, effect and subject, the Philosopher states: " Realities which are the same according to analogy will have means [which], too, are [related] according to analogy." [11]

If Aristotle makes fairly little use of the terms *avaA.oyov* and *avaA.oy[a* in his strictly logical works, in his treatise on *Rhetoric*, on the contrary, he uses them frequently.

Again we encounter the meanings we have already indicated: *avaA.oyov* means a similarity of relation. If the genus man is taller than the genus woman, the tallest in the first genus will be taller than the tallest in the second.[12] *Analogue* also expresses the proportion safeguarding what is appropriate. Speaking of the ornamentation pertinent to style, the Philosopher makes the following observation:

> Style will have normal appropriateness if it expresses emotions and customs and if it is analogous *(&.va.\oyov)* to the subjects under discussion. There is an analogue *(TO 8' ava.\oy6v bmv)* if one does not speak casually about important matters, nor solemnly about trivial matters, nor highly ornaments an ordinary word; otherwise one would fall into a comic style, as does CleophonY

[11] *Ibid.,* 17, 99a 15-16: *Ta KaT' U.va?..o-ylav Ta avTa* which is translated into Latin as *secundum proportionem.* One should also consult the rather special place *(Post Anal.* I, 1!'l, 78a 1 sq.) where Aristotle cites the illogical argument of *Caeneus:* "Fire increases rapidly and therefore in a manifold way, €v *Tij* 11'0AAa-71'Aa<Fiq. *U.va?..o-ylq.,* which is translated by *in multiplici proportione* and which J. Tricot translates as *proportion geometrique* [geometric proportion] in reference to *Philopon,* 159, *!'ll'l* sq.

[12] *Rhetoric* I, 7, 1363b !'l6-!'l7. Speaking of the greatest good and the greatest usefulness, the Philosopher notes that " the greatest represent genera and the greatest among these are analogous *(U.va?..o-yov,* in Latin *proportionem).* Here is the example he cites: " If the tallest man is taller than the tallest woman, this is because men in general are taller than women; and if men in general are taller, it must be agreed that the tallest man is taller than the tallest woman." And likewise (I, 7, 1364b 7-11) in reference to sciences and their objects, inasmuch as there is an essential relationship between them, we can say, "The more the objects of science are worthy of research and honorable, the more their sciences will be honorable." We again encounter the analogue *(U.va?..o-yov)* among sciences and for the same reasons. Likewise II, !'l3, 1399a 33: ek *Toil U.va?..o-yov (ex eo quod eadem proportione)* ; III, 4, 1406b 31: €v *To/ U.va?..o-yov (ratione proportionis)* is used to express a similarity of relationships between *Archidamos* and *Euxenos.*

[18] *Rhetoric,* III, 7, 1408a 10-14; *U.va?..a-yov* is translated as *conveniens.*

Let us add that one must not use all the analogues *O.va,\oyov)* simultaneously; this caution serves to captivate the listener. I mean, for instance, if the words used are harsh, one must not extend this harshness to the voice, to the countenance and to everything which can be harmonized; otherwise each element [of the art] is manifestly artful; whereas if one uses this feature with one thing, but not with another, the artfulness remains hidden, the same effect being achieved. If, then, mild matters are expressed harshly and harsh matters gently, persuasion is attained. [14]

But it is especially in reference to the *metaphor* that this new meaning of analogue, as what is appropriate, is clearly delineated. Analyzing beauty of style, Aristotle mentions the importance of the metaphor: " One must choose epithets and metaphors which agree with the subject of one's discourse, starting with the analogue (eK *rov clvaA.oyov);* otherwise one risks shocking for lack of appropriateness." [15] The analogue, then, retains a certain appropriateness. Aristotle specifies: " Nevertheless the metaphor must always be derived from the analogue and must refer to both terms and to terms of the same genus. For example, if one says that the cup is the shield of Dionysius, one must say that the shield is the cup of Ares." [16] The Philosopher draws the following conclusion at the end of Chapter 10: Beautiful language is said of the "analogous metaphor." [17]

Furthermore, let us observe the intimate connection between the metaphor-analogue and the image:

As regards images •• . they are always, in some way, very pleasant metaphors. Like the analogous metaphor *(ifJfnrep &va-,\oyov p.ETacpopa),* they always rely upon two terms. For example, to say " The shield is the cup of Mars " or " a bow is a lyre without chords" is a complex metaphor; on the contrary, "The bow is a lyre" or "the shield is a cup" is a simple metaphor. [18]

"Ibid., 1408b *5* sq. *Tois &.v&.Ao'YoP* is translated as *analogis.*

'"Ibid., 2, 1405a 10-11; be Toil *&.v&.Ao'Yov,* which is translated as *ex analogia.*

[18] *Ibid.,* 4, 1407a 14; Toil *&.v&.Ao'Yo" d.vTa;.,..oB,B6va;,.* (Latin translation: *ex analogia ductam).*

[17] *Ibid.,* 10, 1411b 22-28. *p.E'Ta;tf>op6.s*n *T'is &.vd.Ao'Yov* (Latin translation: *duci a metaphora secundum analogiam).*

[18] *Ibid.,* 11, 1421b 88-85; cf. *ibid.* 1418a 14: "The images are metaphors." "The image is very close to the metaphor. The image is a metaphor which differs from

When Aristotle uses the word *avaA.oy[a,* the signification of "proportion" and "appropriateness" are even more obvious. This is especially clear as regards the expression *KaT' avaA.oy[av* which qualifies the metaphor and establishes the most perfect metaphor. With a view to perfection in style,

one must seek these three things: metaphor, antithesis, and actuality *(ivEpyda>).* Among the four types of metaphor, the most excellent are the metaphors according to analogy *(ai KaT' &va.Aoy[av).* Thus Pericles said that the young men who had died in the war had disappeared from the city as though *(wu-rrEp)* Spring were removed from the year. Speaking about the Lacedemonians, Leptines said that the Athenians could not tolerate that an eye be plucked from Hellas . . . Peitholaos called the state-galley the " club of the people," and Sestos "the corn-bin of the Piraeus." Pericles asked that Aegina, "that eye-sore of the Piraeus" *Toil* IIELpa[Ew>) be removed. [19]

The metaphor places the fact before the eyes *('rrpo OfLfu5mJ)v).* "... Iphicrates has said: ' In my view, the path of discourse runs through the deeds of Chares.' This is a metaphor according to analogy and ' through this the fact is placed before the eyes.' " [20] Returning to the meaning of the expression " placing facts before the eyes," that is, putting them into the very

it only because it is preceded by a word. Furthermore, it is less pleasing because it is somewhat better developed ... " (III, 10, 1410b 17 sq.). " To say that an honest man is square is a metaphor" *(Ibid.,* 11, 141lb 24-25). It is a metaphor to " animate what is inanimate" *(Ibid.,* 1412b 32). Thanks to such metaphors " objects appear to be active" *(evep-yovvra) (Ibid.,* 1412a 2).

[19] *Ibid.,* II, 9, 1387a 28. Speaking of the good, he says: "Since not every good belongs to everyone, but there is proportion and the suitability of one thing to one person, but not to another *(ava"Ao-yla Kal T0 il.pp,6rrov);* as, for instance, fine weapons belong to the brave but not to the just." (*'Ava"Ao-yla* is here translated as *analogia* and *il.pp,6rrov* as *aliud alii convenit)* .

[20] *Ibid.,* III, 10, 1410b 35-1411b 2. Aristotle defines the metaphor as follows: " that which contributes the greatest clarity and agreement to thought, as well as the special characteristic of which we have spoken ... " *(Ibid.,* 2, 1405a 8-9). " Do we seek to embellish the subject? Then we must draw the metaphor from what is the best in the name genus. Do we want to debase it? We must borrow the metaphor from what is the worst." For example: " Those whom some call the ' flatterers of Dionysius' call themselves artists. These two terms are metaphors, but one has the effect of degrading, the other has the opposite effect." (1405a 14-15 and 23-25).

act or function of signifying, Aristotle shows from this that the ordinary metaphor does not suffice, that, " like the poet," we must look for a metaphor " *which is in keeping with analogy* *KaT' ava>.oy£av* as, for example, what the stone is to Sisyphos, so he who acts shamelessly is to him who is treated shamelessly." [21]

With the *metaphor in keeping with analogy* we are in the presence of a meaning of analogy which Aristotle carefully delineates. This analogy implies a similarity between two relations and thus includes at least four terms; it has an evocative power which makes abstract realities present in visible images. In poetry the discovery of the metaphor plays an extremely important role, similar to that of induction in philosophy:

> We must draw metaphors *(p.£mcplp£w)* from things which are close to us and yet not obvious, as in philosophy the man with a quick and sharp mind perceives similarities even in very distant realities *(r6 op.otov lv* 7TOAiJ Bdxovtn)' just as Archytas said that a judge and an altar are the same because both serve as a refuge for victims of injustice. [22]

In the *Poetics* we encounter Aristotle's most explicit definition of what he means by *analogue* in relation to the metaphor. The metaphor is the transfer *(eTrtcpopa)* of the name of one thing to something else, the transfer from genus to species, from species to genus, or from one species to another, or in keeping with the analogue *(1] KaTa TO avc£>.oyov)•* A transfer from genus to species is exemplified in: " My ship is standing here, since riding at anchor is a type of standing .... " [28]

> I say that there is an analogue (T6 *d.va,\oyov* ,\lyro) when the second term is related to the first in a way similar to that wherein the fourth term is related to the third, since then one uses the fourth term instead of the second and the second instead of the fourth. Sometimes, too, one substitutes for the subject of one's discourse that to which this subject is related *(7Tp6-;* o). I say, for instance, that the cup is to Dionysius what the shield is to Ares. One will say that the cup is the " shield of Dionysius," and the

[21] *Ibid.,* 11, 14Ua 5.
•• *Ibid.,* 141!!a 10-14.
[18] *Poetics* !!1, 1457b 7-9: Cf. *Odyssey* I, 185, as well as *Poetics* 4, 1448b 88.

shield the " cup of Ares." Evening is to day what old age is to life. One will say, then, that evening is " the old age of the day," and old age is " the evening of life," and, with Empedocles, " the sunset of life." In certain cases, the corresponding analogous term *(nov avaAoyov)* has no name, but the relation will be none the less communicated. [24]

Truly, then, the analogue is such a similarity between two relations as enables the communication of the metaphor to be accomplished in a very profound way. The analogue seems to imply four terms connected among one another according to two similar relations. In the metaphor the analogue achieves the most perfect metaphor.

Reflecting upon this first series of texts, extracted from the *Organon,* the *Rhetoric,* and the *Poetics,* we can easily delineate various meanings of *analogue:*

I) That which implies a broader commonness than that of the genus. " Common by analogy " expresses something far beyond what is generically common;

2) That which implies a relation in similarity and thereby maintains a certain appropriateness; that which expresses a similarity among relations;

3) That which is achieved very clearly in metaphorical analogy, or, if one prefers, in the analogous metaphor.

The term *analogy* formalizes the term *analogue* as the abstract formalizes the concrete; we encounter the same meaning in both terms. The *Kar' avaA.oy[av* makes the formal meaning even more explicit, as it does also as regards the expression *metaphor in keeping with analogy.*

B. *Physics, De Coelo, Meteorology*

If we go on now to investigate the philosophy of Nature as we find it in Aristotle's basic book and in his two most speci-

•• *Poetics* 21, 1457b 17 sq. Aristotle again insists on the importance of metaphors: " The most important thing by far is to excel in the metaphor. Indeed, it is the only thing which one cannot learn from another, and it is a sign of natural talent, since, with a view to making good metaphors, one must notice what is similar" (To *TO 5/LOLOP Oewpeiv)* 22, 1459a *5* sq. (Here *avaAO')'OV* is translated by *analogum).*

fying books, we can discern various textual segments where the Philosopher makes explicit use of the terms *analogue* and *analogy.*

Physics

Analogue is used rather infrequently (six times) , as also is *analogy* (four times). *Analogue* expresses similarities in relations among various realities. Showing that the void is impossible, Aristotle concludes: " It is clear, then, that if there is a time during which a body goes through the void, one comes to this impossibility: a body can simultaneously go through the empty and the full, since there will be a *certain analogue* (n *avaA.oyov)* of one body to another *(lTEpov 7Tp0<;* ETEpov) as of one time to another time [ills *x_p6vos 1rpos x_p6vov)*." [25] This analogue expresses the relation existing between the movement of a certain body and the time measuring this movement, but this relation no longer exists when it is a question of the void. Aristotle himself explicitly states this in summarizing his conclusion: "Briefly, the cause of this conclusion is obvious, since there is a relation (A.6yos) between all movement and one movement (since they are in time, and there is a relation between all time and one period of time, the two being limited quantities), but there is no relation between the void and the full." [26]

In the second chapter of the same fourth book, the Philosopher makes the following emphasis relevant to the relation existing between the magnitude *of* a body and its movement: " Since what precedes and what follows are in the magnitude [of a body], they must also be in movement, according to what is analogous to magnitude *(avaA.oyov Tot<;* eKe'i). However, what precedes and what follows are also in time since, in every case, time and movement accompany each other .... " [27] *Analogue,* then, expresses a similarity of relations between the precedent and the consequent in their movements and the periods of

•• *Physica* IV, 8, 216a 6-7.
•• *Ibid.* 216a 8-ll.
[21] *Ibid.,* 11, 219a 16-18.

time measuring their movements. *Analogue* is used in the same way to express the similarity of relations existing between power the quantity of the body, its movement, and its time.[28]

Analogy is used to express the fact that a certain reality cannot be known directly in itself, that it can be known indirectly by reason of the similarity among certain relations. "The subjected nature," Aristotle affirms, "is known by analogy, as bronze in relation to the statue, wood to the bed, matter and what lacks form to what has form but before assuming form; in the same way matter is related to substance, the individual, and existence."[29]

Analogy also expresses a similarity among relations: "For each finite power time, too, must be finite; indeed, if a given power moves in a given time, the greater power will move in a shorter, yet determinate time, and this according to the inversion of analogy *(KaTa Tijv* In this last text *analogy* qualifies the inversion explaining that it is achieved antithetically and proportionally. The relation remains despite the inversion.

Finally *analogy* here expresses a certain type of relationship or proximity which differs from generic and specific commonness, yet is sufficient for the avoidance of mere equivocation.

[28] *Ibid.*, VII, 5, 250a 4. "If the same force moves the same body a certain distance in a certain time, it will move it half the distance in half the time, and half the force will move half of the body an equal distance in an equal time. If E represents half the force of A, and Z half of the body B, the force and the weight will be similar (op.olws *of]* and analogous *(dva>..o-yov)* to each other, so that each force will move each body an equal distance in an equal time." Likewise, 250a 10-15: "And if, in time force E moves Z by r, it does not necessarily follow that E force will move twice Z by the half of I' in an equal time. And finally, if A moves B in .i by a distance equal to I', it does not follow that half of A, namely E, will move B in time .i, nor in any part of D., over any part of I' or any part of I' which is analogous *(dva>..o-yov)* to the totality of I', in the same way that A is relative to I'." Finally, 250a 25-28: "If there are two forces and each moves a given body a certain distance in a certain time, then the combined forces will move a body composed of the two weights an equal distance in an equal time, for it is analogous *(dva>..o-yov -ya.p).*

[29] *Ibid.*, I, 7, 191a 8: *€mO"T7JTTJ Ka.r' dva."Ao-yla.v.*

Here, then, *analogy* expresses a broader and suppler similarity than that of the genus, this similarity being situated between equivocation and generic unity.

Making a mutual comparison among movements and trying to determine how realities can be mutually compared, the Philosopher concludes: " This argument shows that genus is not some one thing, but that a plurality (1ToA.Ac£) lies hidden close to it (*7Tapa TovTo)*; that some homonyms are far removed (7ToAv others have a certain similarity *(nva 'TYJ'Ta)* others are close (eyyvc;) by reason of genus or analogy *(avaA.oy£q.)*. This is why they seem not to be homonyms (." [31]

De Coelo

In the treatise *On the Heavens and the Universe,* the Philosopher likewise uses the terms *analogue* (three times) and *analogy* (twice), as well as the verb *to analogize (avaA.oyt,eCT-* (twice) . *Analogue* expresses a certain relation: **"If,** then, the sizes are analogous *(avaA.oyov)* to the weights and the lesser weight is that of the smaller size, the greater weight will also be that of the larger size." [32]

Analogy, too, expresses a certain relation. Considering the relations between weights and temporal spans in regard to what is mobile, Aristotle emphasizes that temporal spans are inversely proportionate to weights: "Temporal spans have the analogy *avaA.oy[av)* of weights in an inverse way; for

[30] *Ibid.,* VIII, 10, 19. Cf. also IV, 8,

[31] *Ibid.* VII, 4,

[32] *De Coelo* I, 6, S sq. Likewise, speaking in a hypothetical manner of an infinite weight, the Philosopher states: " On the one hand, it moves itself in the measure that it is as heavy as the finite weight, plus something, but, on the other hand, it does not move itself at all, insofar as what is analogous (dvdXo-yov) must be moved according to the transcendent " *(De Coelo* I, 6, 6 sq.). Let us also cite this passage: "- - - one must therefore admit, on the one hand, that an equal body in an equal time can change an equal body, on the other hand, that a smaller body in an equal time alters a smaller body and that a larger body will alter a larger body, the analogue (dvdXo-yov) of the altered body to the altered body being exactly that of the greater body to the smaller body " (1, 7, 7 sq.).

instance, if half a weight moves in a giVen time, twice the weight will move in half that time." [83]

Speaking of lightness, he states: " I£ the relation between the solid and the void exceeds a certain analogy *(avaA.oy£as-)* the body will not be lighter." [84] Finally, the verb *to analogize* expresses a calculation, a reasoning: " Among the mathematicians, those who try to analogize the size of the circumference." [35]

Meteorologica

In this work Aristotle uses *analogue* and *analogy* according to meanings which are very much like the preceding. *Analogue* signifies that diverse realities have similar relations, similar properties, activities and situations in the midst of their diversity.36 *Analogy* signifies proportion-thus one can speak of

[33] *Ibid.,* I, 6, 273b 32-274a

"'Ibid. IV, 2, 309a 14.

[33] *Ibid.,* II, 14, 298a 16: *cl.vaXo')'LreuOat.* Likewise II, 13, 31-34 in reference to a reasoning: "Fire is nobler than earth and that which is at the limit is nobler than intermediary things. The circumference and the center, however, are limits, so that analogizing on this basis [Latin translation: *ex his ratiocinantes],* they think that it is not the earth that occupies the center .... "

[36] *Meteorologica* I, 2, 339a 18: In regard to the four elements one sees that, with reference to the two extremes, two intermediate elements are in an analogous position, *cl.va'Xo')'ov* 'which is translated into *proportionem servans.* I, 11, 347b 14: In regard to the three bodies condensed by the cold, two of these bodies, analogous to the phenomenon of this earth, result from the same causes. *'Avcl.Xo')'ov* is translated into *pari ratione.* I, 14, 351b 4: Rivers disappear here, are proportionately formed elsewhere ... *'Ava'Xo')'ov* is translated into *proportione.* II, *5,* 362b 32: Having stated the necessity that there should be a region having the same situation in regard to the other pole as ours in relation to our pole, one can conclude: It is clear that the rule of the winds will be proportional; 'fls *cl.va'Xo')'ov* is translated into *proportione.* II, *5,* 363a 11: In regard to the winds, one notes that no wind blows from the tropics in the winter, for then there would have to be another wind blowing from the tropics during the summer, and this would reestablish the proportion *(ro cl.va'Xo')'ov: proportio).* III, 2, 372a *5:* In regard to the double rainbow, one notes that, with the exception of the two outer bands, the bands are proportional *(r<'ts* d.XXas *cl.vaXo')'ov: proportione).* III, 4, 375a 4: Concerning the rainbow, the two other color bands are analogous *(avaAO')'OP: proportione respondet)* . IV, 390a 6: Speaking of what is intermediate in relation to the two extremes (matter and substance), the Philosopher states: They are " analogous to the extent that they approach the extremes *(cl.vcl.Xo')'ov: secundum rationtmt)* ."

the equality of common analogy-, [87] and *according to analogy* indicates a unity distinct from that of the common name. [88]

By way of summary, we can conclude that in the treatises on the *Philosophy of Nature, analogue* expresses primarily a similarity of relations affecting three terms (for instance, bodies, sizes, movements, temporal spans, efficacious powers, weights); this relation is expressed by *ETepov 1rpoc; ETEpov. Analogue* expresses, too, a similarity existing among certain states of imperfection or dependency affecting bodies and qualities with regard to other states of perfection or fundamental conditions affecting these bodies and these qualities.

Analogy qualifies homonyms which are close but of a different proximity than that of genus, and it indicates a unity distinct from that of a common name (when there is a generic unity there is a common name, when there is no generic unity there is no common name). Analogy, then, expresses a Similarity of relations and also a relation.

C. *Philosophy concerning the Living*

In the treatises on the *Philosophy concerning the Living* the terms *analogue* and *analogy* are used more explicitly and more frequently. This is very clear in the treatises *On the Parts of Animals* and the *History of Animals,* but it is evident, too, in the tracts *On the Soul* and *On Generation and Corruption.* In the treatise *On the Soul* the term *analogue* signifies *having a relation,* a *correspondence:*

It seems that smell is analogous to taste *(&.vaA.oyov lxeLv 7rpO<; yeil<nv: similem rationem subire ... ad gustum),* and likewise that the species of taste are analogous to the species of smelJ.[89] We must also extend what belongs to the parts of the whole of the living

[87] *Ibid.* I, 3, 240a 4: **"If** there were two elements to fill the intermediate region between earth and heaven, the air would far exceed the quality of common proportion which must be maintained among bodies of the same order" *lu6rrtra* rijs Ko<vi)s *aval\o'Ylas uvuro<xa: communis rationis).*

[88] *Ibid.,* IV, 9, 387b 3: " There are no common names for wooden bodies, bones, or hair, but they are all analogously in the same nomenclature *(Kar' aval\O'Ylav: propter similitudinem).*

[89] *On the Soul,* II, 9, 421a 16-17.

body, for there is a proportion: *(avaA.oyov* lxn: *est rationum similitudo)* as the part is to the part, so is the total sensation towards the body in its totality, as such.[40] There seems to be an analogue *(avaA.oyov lxHv)* between the sharp and the blunt in touch, since the sharp stabs in a certain way and the blunt pushes in a certain way inasmuch as one movement occurs in a short time, the other movement in a long time, so that, as a result, the one is quick, the other is slow.[41] But certain objects have an analogous smell and flavor *avaA.oyov Κat xvp.6v):* I refer, for instance, to the fact that they have a sweet smell and a sweet flavor.[42] Being awake is *analogous (ava.Aoyov)* to contemplation, sleeping to its possession but not to the act of using it-4[3]

Analogue is also used to express that which is capable of fulfilling a similar function:

One asks what the organ of touch is: is it the flesh and the *analogue* (ro *avaA.oyov)* of the flesh for those who do not have flesh? [44] --- roots are the *analogue* of the mouth, for both absorb food.... [45] Like (wo;) the head of animals, thus (oilrw>) the roots of plants, if we judge the different or the same organs by their operations. [46]

We see that in the treatise *On the Soul analogue* undoubtedly always has the same meaning but with new nuances and delineations; there is more insistence on relation than on similarity among relations. Moreover, there seems to be a new meaning for *analogue,* the analogue of function, a meaning which is well developed in the treatise *On the Parts of Animals.* In this treatise, investigating the reason why men have not designated aquatic and flying animals by the same name and united them in the same genus, the Philosopher recogmzes the basis for the ordinary classification:

•• *Ibid.,* 1, 421b 23-25.

u *Ibid.,* 8, 420b 1-4.

•• *Ibid.* 9, 42la 28. Let us take note also of III, 7, 43la 22: Speaking of the *common sense,* he specifies that it is one analogously *(Iv r{jJ* dvdXo')'ov) and numerically (*r{jJ dpt8p.{jJ).*

•• *Ibid.,* II, l, 4Ua 25; 412b 28; 413a 1.

•• *Ibid.,* 11, 422b 21; 423a 15.

•• *Ibid.* I, 412b 2.

•• *Ibid.,* 4, 416a 4 sq.

In fact all groups differing among one another only by excess and degree are united in a single genus; on the contrary, all *analogous* groups (EXEL *TO ava,\oyov)* are separated. I am speaking, for instance, of a bird which differs from another bird only by degree, or, in other words, by excess (one has large wings, the other has small Wings), whereas fish differ from birds by analogue (Tijl *avct,\oyov)* (what the feather is for one, the scale is for the other). It is not easy, however, to apply this method to all animals, since most of them have the same analogue among themselves *(ava,\oyov TaVTo).*47

The Philosopher makes a clear distinction among the differences which are reduced to the more and the less, achieved within one and the same genus, and those which cannot be reduced to the same genus, yet all having a *similar functional, relation.* This is what he calls *analogous,* " as is the case between man and fish, so also between bone and fishbone." [48] Beyond the diversity among genera one can perceive certain similarities on the functional level. What the bone is in the morphology of man, the fishbone is in the morphology of the fish. The Philosopher himself says: " By analogy I understand the fact that while some possess a lung, others do not, yet these others have another organ which takes the place of the lung. Likewise some have blood, while others have what is analogous and possessing the same *power (8vvap,w)* that the blood has in the sanguinous animals .... " [49]

Having specified what must be understood by "actions common to all living things," unlike those which are common according to genus or species, the Philosopher again says: " Indeed, some animals have *something in common according*

"Parts of Animals, I, 4, 644a 16-23. Cf. J. M. Le Blond, *Aristote, Philosophe de la Vie, Le livre premier du traite sur lea parties des animaux* (Paris: Aubier, 1945), p. 178, note 125: " Analogy excludes any direct resemblance among the parts, it comprises only an indirect similarity in a comparison of the relation between the organs and their functions. Thus the scale is to the fish what the feather is to the bird, the bone is to man what the spine is to the fish." Cf. p. 65: "Returning to the subject frequently, Aristotle clearly distinguishes between these similarities of structure within a single genus and the *analogues* or *functional similarities* existing among various genera."

•• *Parts of Animals,* I, 4, 644b 12.

•• *Ibid., 5,* 645b 6-10 (Aryw /)' dvdAO"fOJI); cf. n, 8, 65Sb *85;* IT, 2, 648a *5.*

to analogy (To *Kowov KaT· avaAoy£av)*, others according to genus, others according to species." [50] This something-in-common-according-to-analogy seems to be something even more common than what is common according to genus, since it implies only a similarity among relations which can be understood in relation to functions ends, faculties, organs, and even parts of the living thing. [51]

Certain *"analogical"* comparisons in the *Parts of Animals* seem to be very close to simple metaphorical comparisons, as, for example: " The fins are to fish what oars are for boats." [52] In the tract *On the Soul* Aristotle himself uses *KaTO.* to describe a reasoning which he could have qualified as *KaT· avaAoy£av* in his treatise on the *Parts of Animals:*

> Likewise as colors are not seen without light, so the acute and the grave are not heard without sound. According to the metaphor *(Kara* these are said of tangible objects since the acute moves the senses in little time and more lastingly, the grave slowly and more passingly. Nevertheless the acute is not what is quick, and the grave is not what is slow, but a similar movement is produced through rapidity on one hand and through slowness on the other. [53]

Is there a new delineation of Aristotle's thought in the tract *On the Soul?* We must specify the relation and the difference, existing in the Philosopher's thought, between the *KaTO. p.eTa-* and the *KaT· avaAoy£av.* What is certain is that analogy, as he conceives it, plays a very important role in the inquiries

•• *Ibid.,* I, 5, 645b !l6-!l8.

[51] *Ibid.,* II, 3, 650a *35.* Aristotle speaks of the *analogue* of blood in animals who do not have any blood, blood being deemed the inherent nourishment of sanguinous animals: " If blood exists in sanguinous animals, it is for the purpose of feeding them." Likewise, with reference to the brain of sanguinous animals, the Philosopher states that there is an analogous organ in the octopus (II, 7, 652b 25). The brain produces sleep in animals having a brain, in brainless animals the analogue [produces it] (II, 7, 653a 11).

•• *Ibid.,* IV, 694b 9-10.

•• *On tke Soul,* II, 8, 420a 27 sq. Speaking about the imagination, Aristotle specifies: "Leaving aside all metaphorical usage of this term *(Kam\ p.era.,Popav* Xe"fop.ev), we can say that is only a faculty and a state through which we judge and through which we can be in truth or error " (ill, 3, 428a 2).

about the *Parts of Animals.* This is easily understood, since the Philosopher seeks especially to grasp the proper causes and, among them, the final cause *in view whereof* the parts of the living thing exist. For nature makes the organs for the work *(1rpoc; To epyov)* and not the work for the organs.[54] The *7Tpattc;* and the *epyov* finalize the organic parts of the living. In the treatise on the *Generation of Animals analogue* is used fairly often (twelve times), the *KaT' avaA.oytav* once, as also the verb *to analogize. Analogue* is used primarily, as in the *PaJ"ts of Animals,* to express a similar function, "that which corresponds," " that which takes the place of," as, for example, the analogue of grease,[55] the analogue of blood,[56] the analogue of the seed,[57] the analogue of the menstrua, [58] the analogue of the heart, [59] the analogue of the flesh,[60] the analogue of the teeth, [61] the analogue of the hair.[62] But it signifies, too, "the fact of having the analogue " or " implying a proportion." [63] *According to analogy* is used, along with *according to similarity,* in reference to the sexes of plants as compared with the sexes of animals.[64] The verb *to analogize* means to estimate or reflect.[65]

In the treatise on the *History of Animals, analogue* has primarily the same meaning-to have a similar function-as in

[54] *Parts of Animals,* IV, 1Q, 694b 13-14.

.. *Generation of Animals,* I, 19, 7Q7b 4; *TO avaAO")'OP* is translated as *respondet* and, in Sylv. Maurus, as *proportionale.*

[56] *Ibid. QO,* 7Q8a *QO,* and 19, 7Q6b Q: *TO avaAO")'OP* is translated as *respondet.*

[57] *Ibid.,* 19, 7Q7a 3: 8n *avaAO")'OP* WS Tois *f1ppe<nv f} ")'OP1} oiiTW* Tois (Ji):>..ern *Ta KaTaf.'i}vuJ. (dva:>..o")'ov* is translated as *respondet).*

[58] *Ibid., QO,* 7Q9a *QQ.*

[59] *Ibid.,* II, 1, 735a Q4-Q6: *To Tavrv ava:>..o")'ov,* translated as *quod cordi respondet;* II, *5,* 741b 16; 6, 74Qb 37.

[60] *Ibid.,* II, 6, 743a 10.

[61] *Ibid.,* 745b 10: *TO avaAO")'OV* Tois *&ooii<nv,* translated as *respondet.*

•• *Ibid.,* V, 3, 78Qa 31.

[63] *Ibid.,* III, 10, 760a 1Q: Ll<ll *Kai avaAo")'6v7rWS i7 ")'e avrwv* (translation: *proportio)* .

•• *Ibid.,* I, 1, 715b QO: *Ka(J' Of.'ot6T7JTa Kai Ka.T' dva:>..o")'la.v :>..e'YeTaL* (translation: *proportione)* .

[65] *Ibid.,* V, 3, 783b 3Q: *'AvaAo")'lrT7JTaL* (translation: *reputet* and, in Sylv. Maurus, *cogitet)* .

the *Parts of Animals* and in the *Generation of Animals:* the analogue of the matrix, [66] the analogue of the organ of touch, [67] the analogue of feet and wings,[68] the analogue of the breast, [69] of blood and veins (lymph and fibers) / [0] of the flesh/ [1] of bones,[72] of hair/ [3] of veins, nerves and skin,[74] the air that we breathe. [75]

Analogue expresses similarity, appropriateness. [76] As affecting the qualities of men and animals, *analogue* expresses something other than their identity and their relationship; it is the third type of unity between parts. [78]

The expression *Ka:r' avaA.oy[av* is utilized three times to express a special type of unity existing among organic parts, yet neither the generic identity nor the specific identity nor the identity according to more or less, but according to analogy; [79] in other words, what is said of identity can be said of the difference among the parts. [80]

[66] *History of Animals,* I, 8, 489a 14.
[67] *Ibid.,* 8, 489a 22.
[68] *Ibid.* 4, 489a 29.
[69] *Ibid.,* II, 1, 497b 88: *avaAO'YOV* II, 12, 508b 81: 1'0 *avaAO')'OJI 1'qJI1'Ti!0eL* (translation: *pectOTis vicem gerit).*
[70] *Ibid.,* III, 2, 511b 4.
[71] *Ibid.,* 5IIb 6.
[72] *Ibid.,* 7, 516b 14.
[78] *Ibid.,* 10, 517b 8: *1'WP avaAO'YOJI* (translation: *quae ipso1'Um geront vicem).*
[74] *Ibid.,* 16, 519b 26-28.
[76] *Ibid.,* VIII, 2, 589b 18.
[76] *Ibid.,* II, 1, 501a 8.
[77] *Ibid.,* I, 1, 487a 5: *avaXo'Yov* is translated as *conveniunt.*
[78] *Ibid.,* VIII, 1, 588b 8; 1'ct ll' *avaAO'YOV* is distinguished from 1'Cl.V1'ct and from *7ra.pa.7rA.qi1'La.* (translation: *proportione, eadem, similia).*
[79] *Ibid.,* I, 1, 486b 19: *Ka.T' ava.AO'Yla.v* (translation: *similitudine* and, in Sylv. Maurus, *proportione quadam).*
[80] *Ibid.,* 2, 488b 82. Speaking of the organs through which the animals take their food, the Philosopher states that these organs are identical (Ta.vTa) or diverse *(hepa.).* This diversity is either *Ka.T'* elllos or *Ka.O'* or *Ka.T' ava.Xo'Yia.v* or through position (Tfi *0ll1'eL).* Likewise I, 6, 491a 19, where Aristotle returns to the various modalities of diversity: through form (etlleL), through excess *(v7repoxfi),* through analogy through the contrariety of affections. *('Ava.Xo'Yia.* is translated as *convenientia).* Cf. also II, 1, 497b 11: Certain animals differ generically and are one by analogy *(Ka.T' &.va.Xo'Yia.v* Tl; *'YEVeL lnpa.),* others are generically identical and specifically different.

In these various texts of the treatises *On the Soul,* the *Parts of Animals,* the *Generation* and the *History of Animals,* it is easy to see that *analogue* is employed especially to express " what fulfills the function of," " what takes the place of," and, therefore, what is known only through another and through the similarity of its function. *Analogue* expresses a vital function which we know through its similarity to another vital function. It signifies, also, relation or proportion.

In fact, the term *analogy* is used much less frequently; it is used only in the tract *On the Soul.* Is there a reason for this? When used, this is with a view to characterizing a type of unity and difference that cannot be expressed in terms of genus or species and which, nevertheless, is neither identity nor equivocation.

D. *First Philosophy*

In the *First Philosophy* Aristotle uses the terms *analogue* and *analogy* explicitly only a few times *(analogue,* eight times; *analogy,* four times), but he uses them with great precision. Again we find *analogue* with the meaning of what takes the place of, plays the role of, and this time in reference to substance. Speaking of substance, the Philosopher specifies: " Differences are never substance, not even in their union with matter; they are, however, the *analogue* of substance in all these cases. Moreover, just as in the definitions of substances what is predicated of matter is the act itself, so in these other definitions it will be what is the most actual." [81]

To discern an analogy is to discern what cannot be defined through genus and specific difference but implies a relation; and in order to manifest the full force of this relation, one shows the manner in which it is achieved in various cases. The act as end-term of " that which is " is discovered by induction in a synoptic view bringing the analogue to light:

> The act which we propose can be elucidated through induction starting with particular cases. We must not seek to define every-

[81] *Meta.* H, !l, 104Sa 4-7.

thing, we must also know how to discern the analogue *(Tip av&A.oyov)* in a synoptic view *(avvopiiv).* The act will then be as the person who builds is to the person who has the faculty to build, he who is awake to him who sleeps, he who sees to him who has his eyes shut but possesses sight, that which has been separated from matter to matter, what is elaborated to what is not.[82]

Within a synthetic view, grasping an analogue is clearly opposed to knowing through genus and specific difference, a knowledge proper to definition. Here we see a very interesting connection between induction and the *analogue.* It is easy to recognize that act is not said of all things in the same way but according to the *analogue.*[88] *Analogue* expresses a unity of a special type, a unity which exceeds generic diversity. Discussing the variety of causes and elements in relation to various beings-ali.Aa S€ *aAA.wv-*, Aristotle observes: "The principles are the same through the *analogue* ... but *aAA.a* TE *aAAoL<; KaL a'A'Awc;*"; [84] likewise: "Things which are not in the same genus have various causes, except for the *analogue."* [85] Analogical unity exists beyond the variety of attributions and modalities of being. One speaks of the *one analogue* in connection with being,S[6] and of the *analogue* within each category of being.[87]

Analogy characterizes a particular unity. Discussing the *one*, the Philosopher specifies that *one* can be understood in reference to number, species, or genus, and then adds: according to analogy *Kar' ava'Aoy£av;* they are all things which are related as one to another (ocm *W€; aAA.o 'TI'po<;* a"-Ao) .[88] Aristotle specifies: "What is one in number is also one in species, while what is one in species is not always one in number; everything that is one in species is also one in genus, but what is one in genus is not always one in species, but can only be one according to

•• *Ibid.,* e, 6, 1048a 85 sq.

[83] *Ibid.,* 1048b 7: cL\}..' ij *dvd}..o-yov* is clearly distinguished from *O/J-olws.*

•• *Ibid.,* A, *5,* 107la 4: *dvd}..o-yov* and 4, 1070b 17.

•• *Ibid.,* 107la dvd}..o-yov.

•• *Ibid.,* N, 6, 1093b IS: *0€ av&;>..o-yov.*

[87] *Ibid.,* 1093b 19: "As the straight is in length, so the level is in surface, perhaps the odd in number, the white in color." This further explains the analogue and WS ... *oeTws* is used.

•• *Ibid.,* .i, 6, I016b

analogy; what is one according to analogy is not always one according to genus." [89] This clearly shows that *unity according to analogy* is deemed the weakest unity since it does not imply a common form as does generic unity, but only a unity of relations in diversity. This text manifests the very particular character of this *ultimate unity according to analogy* as implying a certain universality [90] which is achieved *aA'A.o* S'ev &.A'A.rp.[91]

E. *Human Philosophy*

In Aristotle's *human philosophy,* namely, *Ethics* and *Politics,* we see that he makes fairly frequent use of the terms *analogue* and *analogy.* In the *Ethics, analogue* is used to express a similar relation, a certain resemblance. Speaking about the activities which serve as a basis for the acquisition of a virtue, Aristotle states that they are the same as those which lead to its corruption, the same [analogue having reference] to the builders of a house ... ,[92]

Analogue signifies the middle between two extremes. The following is said on the subject concerning what is just: " In distribution the just is a middle in relation to the extremes, which are outside the analogue *(1rapa To avc£Aoyov)* for the analogue is the middle, and the just is the analogue." [98] *Analogue* expresses the proportion of reciprocity which must exist between unequal friends. If one is superior in virtue, he can be the friend of someone who exceeds him in his social status;

[89] *Ibid.,* 1016b 86-1017a 8.

[90] *Ibid.,* A, 4, 1070a 81-88: "The causes and the principles of various beings in one sense are different (li.AAwv), but, if one speaks in a universal way and according to analogy, in another sense they are the same for all beings." Cf. *ibid.,* N, *!'l,* 1089b 4.

[91] *Ibid.,* A, 4, 1070b !'l6-!'l7.

[92] *Nic. Eth.* II, 1, nosh 9. Cf. II, 8, 1108b !'l6: "The coward calls the brave man rash and the rash man calls him a coward, and the analogous occurs in other cases"; and VII, 6, 1148b 10-18: "The insufficiency of the physician or the agent is not a vice, but analogously like a vice (Tell *avaAo-yov &p.ola.v).*"

[98] *Ibid.,* V, 6, 1181b 11. Cf. 7, 1181b !'l9-S!'l: "The distributive mean occurs *Ka.Ta Tov M-yov* .•• the unjust occurs *1ra.pa To avaAo-yov.* Cf. 9, 1184a 8-1!'l; *Great Ethics* A, 84, 1198b 86-87: " Since the just is analogously equal, *TO* il' *avaAO')'OV lv TETTa.prn -ylveT«< lAa.xluTots."*

otherwise there could be no proportionate equality. [94] Analogue qualifies friendships in order to manifest their degrees. [95]

Analogy is used with even greater precision. Criticizing Plato's "Idea of Good" and showing that this idea does not exist, the Philosopher asks:

But what then is meant by the word good? It does not seem to be a question of homonyms by chance *(a?T6 -roxTJ<>).* Rather it is a question of homonyms proceeding from a single principle (*acp €v6<>)* or of homonyms converging to a single end *(?Tp6., Iv)* or, still better, it is a question about things receiving the same name through analogy *(KaT' avaA.oy[av).* Thus what sight is to the body, the intellect is to the soul, one in the other *(aA.A.o Iv aAA.f!!)*,[96]

And when he himself wants to specify what the good is he observes:

In fact it is self-evident. The good is one thing in one action, something else in another. Likewise, it is one thing in one art, something else in another; it is one thing in medicine, something else in strategy, and so on. What, then, is the good in each of these acts? But what could it be, if not that for whose sake the rest is done? In medicine it is health, in strategy victory, in architecture a house, in another art something else; but in every external action, as in every moral intention, it is the end, since whatever anyone does is done for the sake of the end.... [97]

'rhus the good is victory, health, a house ... The good is achieved in various realities, each, however, having something similar, since each is an end to another, the end being " for the sake of which " everything else is sought and accomplished. This is what is meant by saying that the good is said according to analogy. Here, then, analogy expresses a particular type of unity in diversity, namely, a unity of relations in the diversity among existing realities.

Aristotle here distinguishes unity in diversity from pure equivocation, which proceeds from the same origin or a single

•• *Ibid.,* VIII, 7, 1158a 35-36: *o(nc luareo d.vaXo-yov.* "Just as friendship lasts by reason of the analogue, so, too, the city." Cf. also V, 8, 1132b 38-34.

•• *Ibid.,* VIII, 14, 1162b 15.

•• *Ibid.,* I, 4, 1096b 26-29.

•• *Ibid., 5,* 1097a 16 sq.

end, since in the last two cases unity can still remain extrinsic (the origin and the end), while a similarity of relation is inherent in diversity.

On the subject of virtue Aristotle discusses the concept of the middle. The middle is the equidistant point between. two extremes.

> If we agree that ten is many and two is few, we shall arrive at the relative middle by taking six, for six exceeds one of the extremes in an amount equal to that whereby it is exceeded by the other extreme. Thus we obtain a middle according to arithmetical analogy *(KaTa avaAoytaV)*.[98]

This is the first time that we encounter this aspect of the so-called *arithmetical* analogy, which is distinguished from geometrical analogy (for instance, two is to four what four is to eight) . It would be useless to discuss this at the present, since we shall encounter these distinctions especially in the matter o£ justice. Analyzing what justice is, Aristotle concludes: "Justice achieves a certain kind o£ proportion" which can be easily understood, since the fact o£ being proportionate is not a character proper to abstract numbers but a general property of numbers.

Analogy *avaA.oyla)* is an equality of relations *(ie16nr• A6ywv)* requiring at least four terms. It is evident that a discontinuous proportion comprises four terms, but the same applies to the continuous proportion; in fact, in this latter case, a single term plays the role of two terms and appears twice. For instance, if length A is to length B as length B is to length C, we observe that length B appears twice, so that by posing this length B twice, we obtain four proportionate terms *(TlTTapa Iamt Ta avaA.oya)*.[99] Now the concept of the just also implies four terms, at least four, and in each group of two terms the relation (o is the same; indeed the lengths representing the persons and the parts are divided in similar fashion. Consequently term A is to term B as term C is to term D, so that the whole is to the whole [in the same relation].[100] The mathematicians call this geometrical analogy *(avaA.oylavyEwp.£-*

•• *Ibid.,* II, 5, 1106a cf. Plato, *Timaeus* 86A.
•• *Ibid.,* V, 6, USia 81 sq.
[100] *Ibid.,* 1181b S-7.

, for, as we recall, in a geometric proportion the whole is to the whole as each [part] is in relation to each [part], [which means that the sum of the first and third terms is to the sum of the second and fourth terms as one term from one of the two relations is to the other term].[101] This analogy *(avn7 avaAoyta)* is not continuous, since no term is numerically one for a person as for a thing (<;,, o).[102] The just distribution of the common good is always according to analogy *(KaTa avaAoytav),* the kind [of analogy] mentioned above.[103] In individual transactions the just is a certain equality, and injustice an inequality, but not according to this [kind of] analogy *(KaTa avaAoytav lKdv11v),* but according to arithmetical analogy.[104] The equal is the intermediate between what is the greatest and what is the smallest according to arithmetical analogy *(KaTa avaAoy{av)*.[105]

Discussing the theory of the Pythagoreans who seemed to identify justice with reciprocity, Aristotle shows that reciprocity can be identified neither with distributive justice nor with commutative justice. Nevertheless,

in associations for exchange, it is justice under its form of reciprocity that holds men together according to an analogy *(KaTa avaAoytav)* and not according to strict equality, since the city remains by reciprocally making an analogue (nil *aVTL?TOL€tV avdAoyov)*.[106] Cross-conjunction assures reciprocity, and this according to analogy (*TrJv KaT' avaAoytav)*.[107] If, for instance, A is an architect, B is a shoemaker, C a house, and D a shoe, then the architect must receive from the shoemaker the result of the latter's work and in return give him his own work. If, then, in the first place there is equality according to analogy (To *KaTa avaAoy[av i'aov),* if next there is a reciprocal exchange, then the solution will be obtained.[108] There will be reciprocity, then, when the goods have been made equal, so that the relation between a farmer and a shoemaker will be the same as between the farmer's work and the shoemaker's work.[109] Nevertheless they must not be forced into the form of analogy (d> il' *avaAoyla>)* after they have effected the exchange.U0

[101] *Ibid.,* 7, 1131b 12 sq.
[102] *Ibid.,* 1131b 15-16.
[103] *Ibid.,* 1131b 27-29.
[104] *Ibid.,* 1131b 32-1132a 2.
[105] *Ibid.,* 1132a 29-30.
[106] *Ibid.,* 8, 1132b 31-34.
[107] *Ibid.,* 1133a *5-6.*
[108] *Ibid.,* ll33a 7-11.
[109] *Ibid.,* 1133a 81-88.
[110] *Ibid.,* 1133b 1-6. In reference to this text, R. A. Gauthier makes the following observation: "The expression which must be put into a proportion (els *uxfip.a.*

And finally here is Aristotle's explanation of justice:

> Justice is a disposition by virtue whereof the just man is defined as the person who is apt to do what is just by deliberate choice, the person who, in a distribution to be effected either between himself and another or between two other persons, does not give himself too large a part of the desired good and too small a portion to his neighbor ... but gives each a proportionately equal part *(Toil Zuov Toil KaT' &va.\.oy{av)* and acts similarly when the distribution is made among thirds *1rpo> a.\.Aov)* [literally: from another to another]. [111]

On the subject of political justice, Aristotle writes: "This concept of the just is what must reign among men who are associated with a view to self-sufficient justice, men who are free and equal, equal either according to analogy *(Kar' avaA.o-yiav)* or according to number *(Kar' apt0fL6v)*." [112]

From these various textual excerpts it is easy to see that the meaning of analogy is not always the same. In the first text, which concerns the search for the good, *according to analogy* expresses the final unity of function in diversity, whereas in the texts wherein Aristotle discusses *geometrical* or *arithmetical analogy* or even *equality according to analogy*, this analogy, still signifying an equality of relations and therefore a unity in diversity, remains very close to the *mathematical schema*, obviously transposed and applied to the case of the just and the mean.

Analogy, then, expresses an equality of relations among four terms. This equality of relations is achieved according to the arithmetic or geometric type of analogy. It is distinguished, on the one hand, from absolute equality, and, on the other, from pure diversity. It maintains a certain equality in diversity.

ava.Xo-ylas lf.-yetv) refers to the formula A + D: B + C = A: B; in this formula D cannot be just anything but must be reduced to equality, without which the proportion could not be verified. Consequently, one sees why this determination of D has to be effected before the exchange; if one thought of this function only after the exchange, the two parts would first have to enter into the possession of what is theirs and then start their exchange over again" (R. A. Gauthier, *L'Ethique a Nicomaque*, ed. Nauwelaerts [Louvain-Paris, 1958], p. 383).

[111] *Ibid.*, 9, 1134a 1-6.

[112] *Ibid.*, 10, 1134a 26-28.

Even through the sole excerpts of the various texts wherein Aristotle makes explicit use of the terms *analogue* and *analogy* it is easy to become aware of the different meanings of these two terms. *Analogue* signifies either a *relation of similarity* among various realities or diverse functions, or a particular type of unity neither generic nor specific nor purely equivocal, but a unity which maintains something common in the midst of diversity; or a *similarity of proportions* (through which there remains a certain conformity permitting the making of certain metaphors, certain metaphorical comparisons) , or *a similarity of proportion* allowing an induction or special reasoning, or an *equality of relations* of the arithmetical or geometric type.

When Aristotle speaks of *arithmetical* or *geometric analogy*, it is easy to grasp the mathematical origin of such a notion. Nevertheless, we should not resultantly pretend that for Aristotle analogy remains a simple transposition of a mathematical notion into the philosophical domain. This would be a profound misunderstanding of the nature of analogy as understood by the Philosopher. The origin of a notion is one thing, the meaning conferred upon it through use is quite another matter.

It would seem, indeed, that Aristotle uses analogy to express a similarity of relations which are primarily of a qualitative rather than a quantitative order. The analogies extracted on the subject of the vital functions of animals reveal this very well; these analogies are taken from the aspect of finality. Obviously, when Aristotle speaks of justice or discusses equality according to analogy, the qualitative aspect is less visible; nevertheless this aspect remains, since it is a question more of similarity than of true equality, precisely because analogy is opposed to strict quantitative equality and aims at maintaining a kind of unity in the midst of diversity.

In the *Politics* we again encounter the terms *analogue* (twelve times), *analogy* (three times) and the verb *to analogize. Analogue* expresses a profound correspondence among political functions pertinent to various regimes; their analogous (similar) role is brought to light as something more

basic than their diversity .[118] *Analogue* expresses a relationship among various political orders wherein certain common elements, customs, and practices appear as more basic than the diversity among these orders.[114] It expresses similar relations, a similarity among relations,[115] a due and just proportion; the analogous cannot exist among unequals.[116]

Analogue qualifies a harmonious political growth, while a growth which is not analogous, that is, outside the analogue, is a cause of revolt.[117] As the vital growth is organic, so must the growth be within the political community.

To consider certain qualities *according to analogy* is no longer to examine them in themselves or for themselves but in the function of their proper effects.[118] In this way we can investigate "the just and the equal *according to analogy,"* that is, in the functioning of a complete political system.[119]

Analogy also expresses a harmonious and reciprocal mixture of qualities and quantities *a"A."A.?JA.a)•*[120] The verb *to analogize* means to compare, to think in comparisons.[121]

* * *

[118] *Politics* II, 11, 1272b 87: "The kings and the council of the elders are analogous to the kings and elders of Sparta." (*'AvaXo'Yov* is translated as *respondentes* and, in Sylv. Maurus, as *comparatione et proportione quadam respondentes).*

[114] *Ibid.,* IO, I27Ib 40: "The Cretan order is analogous *avahO'YOV)* to that of the Lacedemonians . . . the two have meals in common • . ." (*'AvaXo'Yov* is translated as *proportione quadam respondet).* Likewise IV, 4, 1292a IS-21; 14, I298a 82.

[115] *Ibid.,* VII, 1, 1828b 18: "So that, if the soul is nobler in itself and for us than the body and riches, the best condition of the former must be analogous to the latter." I4, I833a 27: There is a similarity of relation between the parts of the soul and its proper functions. (*'AvaXo'Yov* is translated as *similis ratio)* .

[116] *Ibid.,* V, I, 130Ib 27: "Inequality is everywhere a cause of revolution, whenever the proportional is not distributed to the unequal." *('AvaXo'Yov* is translated as *id quod proportione debetur).* Cf. 4, 1303b 30-34: "so that even a small error at the beginning is analogous to other errors in their parts."

[117] *Ibid.,* 2, 1302b 3. Among the causes of political change Aristotle cites the growth which occurs outside the proportional, *1rapa ro dvaXo'Yov.* Cf. also 8, I302b 34-35 and 40. This proportional growth maintains the symmetry *(11'vp.-p.erpla)* of the parts.

[118] *Ibid.,* III, 12, I282b 40: *Kara r1}v dvaXo'Ylav.*

[119] *Ibid.,* V, 1, ISOla 27: *ro Kar' dvaXo'Ylr:t.v tl!'ov.*

[120] *Ibid.,* IV, 12, 1296b 25.

[121] *Ibid.,* VI, 1320b 20: *dvaho'Y•t6p.evov.*

Considering these excerpts, let us try to specify the principal meaning of the terms under scrutiny. Let us first observe the completely different way wherein the Philosopher makes use of the terms *avaJ...oyov* and *avaJ...oyia*. *AvaJ...oyov* is not declined; [122] but it is used in many different ways: *EK 'TOV avaJ...oyov, 'TWV avaJ\oyov, TO avaJ\oyov ' \ \ i: 'TT'Ept 'TOV avaJ\oyov, KaTa 'TO ava-J...oyov* or *'TT'apa To . . . , Tw • . . , To avaJ...oyov Toto; . . . , Tao; aJ...J...ao; ... 'TO avaJ...oyovEU"'TtV, Tfjo; ... ' 'Tt avaJ...oyov*. Whereas *ava-J...oyia* is declined, we encounter: *KaT' avaJ...oyiav,EV Tfj avaJ...oyiq,Tfjo; KOtvfjo; avaJ...oy[ao;*. What difference is there between *avaJ...oyov* and *avaJ...oyia?* It seems that *avaJ...oyov* explicitly expresses the fact that a given reality, a given activity, implies a relation, a similarity of relation with another given reality, another given activity. Thus it expresses a concrete situation.

'AvaJ...oy[a expresses the formal aspect of this concrete state, that by virtue of which the *avaJ...oyov* is *avaJ...oyov*. It is the abstract form, one might say, of this concrete state. It seems that the Pythagoreans and the mathematicians especially made use of this abstract form, which is found in Plato, too. While Aristotelian analogy is characterized by a more frequent use of the concrete form, the latter is not only a manner of looking at reality, a method of thought, but also a manifestation of something real, a manner of existence within reality itself.

The few explicit definitions of *avaJ...oyov* and *avaA.oyia* provided by the Philosopher should be clearly indicated.

I say *analogue* when the second term is related to the first in a way similar to that whereby the fourth is related to the third. One may then use the fourth term in the place of the second.[123] I understand by *analogue* the fact that certain animals have a lung, that others have no lung, but have an organ which takes the place of the lung.[124] *Analogy* is an equality of relations (A.oywv) requiring at least four terms.[125]

[122] Only once in the *Ethics* do we find Tel *avaho-ya (Nic. Eth.* V, 6, 1181b 8) and *Kar' ava}.o-ylav* (V, 8, 1188a 6).

[128] *Poetics* 21, 1457b 16.

[124] *Parts of Animals* I, *5,* 645b 7.

[125] *Nic. Eth.* V, 6, 1181a 82.

These definitions show that *analogue* expresses a similarity among relations, a similarity among functions, and *analogy* expresses an equality of relations.

Do these definitions manifest a development in Aristotle's thought? Is the *Nicomachean Ethics* older than the other two writings? This is possible. Aristotle would have made the definition of *analogy* more flexible by examining the *analogue* more concretely. However, does this situation not exist rather by reason of the matter under investigation? In the *Poetics* and in the *Parts of Animals* Aristotle discusses the life of the intellect and life in its principal functions, whereas in the Fifth Book of the *Ethics* he is concerned with justice, which implies equality; the analogy in justice implies an equality of relations; it is an analogy restricted to this particular matter.

Are these definitions of Aristotle exhaustive? We do not think so, inasmuch as *analogue* and *analogy* escape definition, since essentially they are among the indefinables. This is why we must rather deem these definitions to be the prime modalities of analogue and analogy. It is our first way of perceiving them, but not all of their meanings can be reduced to these first modalities; this would involve forgetfulness anent the very nature of analogue and analogy.

When Aristotle says, " Certain objects have an analogous smell and flavor, I refer, for instance, to the fact that they have a sweet smell and a sweet flavor," [126] we face a different type of analogue not implying more than three terms. We are in the presence of a term attributed differently to two different realities. And when he states, " the sense of smell seems to be analogous to taste," [127] *analogous* expresses a relation, a certain similarity, an appropriateness [128] in the manner of functioning in these functions. There remain, then, only two terms explained in relation to each other.

Analogue can express also a harmony between part in relation to the whole, and this enables us to speak of an analogical

[126] *On the Soul* II, 9,
[127] *Ibid.* 16.
[128] *Rhetoric* III, 7, 1408a 10-14.

growth: *Analogue,* too, expresses the middle between two extremes.

Finally, this term expresses a special type of unity, distinct from the unity of genus and species; it is no longer a unity proceeding from the form, it is a unity in diversity, very close to homonymy.

Analogy formalizes what the analogue expresses. There is a distinction between arithmetical and geometric analogy, as well as between the *KaT' avaA.oy[av* and similarity. *According to analogy,* too, is distinguished from what is proper and always expresses something common. We specify, therefore, that unity according to analogy is a unity achieved in diversity,-ws *aA.A.o, 'TT'pos a>..Ao.* It implies a *relation,* an *orientation* (*ordo ad)* .

Analogue and *analogy* always imply an *orientation.* This is possibly the fundamental element, the basic core. In the similarity among relations, the *orientation* becomes a reciprocal *orientation,* like a twofold *orientation.*

Analogue and *analogy* aid a mind which cannot be satisfied with univocal knowledge through genus and specific difference and therefore tries, despite its poverty and limitations, to grasp reality in the most profound way possible, indeed, all realities, including those which it does not grasp immediately.

Normally, *analogue* and *analogy* increase our immediate knowledge under a twofold perspective, namely, comprehension and extension, in the area of the knowledge of universal principles and concepts, as well as in the area of sensible knowledge (the metaphor) . One could say that, within this twofold perspective, there is, as it were, an excellence, an opening, by reason of this *orientation.* Our univocal knowledge is fully determined and limited; it is, as it were, closed upon itself, whereas our knowledge according to analogy is no longer fully determined but remains open.

To have a better grasp of this attempt to transcend, we should focus our attention upon a careful investigation of the various realities, the various terms, and the various principles which are called *analogous* or which are investigated *according to analogy.* One cannot deny that there are some treatises where-

in the Philosopher uses these terms more than in others. In his logical treatises these expressions are used most frequently in the *Posterior Analytics* in reference to principles, which are the most qualitative element in logic. This usage is even more frequent in the *Rhetoric,* at least in reference to the metaphor. And here again, is not the metaphor the most qualitative element in rhetoric?

In his *Philosophy of Nature* Aristotle uses these terms especially in reference to movement, with a view to specifying the connections existing among movement, temporal span, magnitude, etc.; he uses them in the *Meteorologica* to characterize what is intermediate in relation to the extremes, what the position of the part is in relation to the whole. However, the most frequent use of these two terms is encountered in the *philosophy concerning the living thing,* with a view *to* expressing similar functions among various living things, as well as certain similarities among the various parts of the same thing. In the *First Philosophy* these expressions are used especially in reference to act, to *one,* and to principles. They are used in the *human philosophy* as regards justice and friendship, in the *Politics* as regards social functions.

It is easy to see that Aristotle makes the most frequent use of these terms in connection with the problems about unity, potency and act, and common principles. We think that this happens not by chance but because the examination of these problems specifically demands the use of the excellence-method. Movement and vital functions are modalities of act. One supposes act and manifests its nature; the multiple follows upon potency. By reason of their irreversibility, principles are the units of our judgments.

As soon as the Philosopher touches upon the problem of act and potency, he can no longer *define* quidditatively, he can no longer understand other than by way of analogy. It seems that, for Aristotle, the problem about the end, grasped at various levels, makes a special demand for the use of this new method for approaching the real.

To confirm this hypothesis let us make a rapid comparison

between the manner wherein Plato speaks of analogy and the manner wherein he uses it with that of Aristotle. This will enable us to raise the question about the possible development of Aristotle in this field.

Obviously one can deem all of Plato's work to be a manifestation of the order existing in the cosmos and the forms and, from this aspect, affirm that all Platonic philosophy implies analogy. In his work on *Les origines de l'analogie philosophique dans les dialogues de Platon,* Grenet concludes: " Similarity mixed with dissimilarity, this, then, is the true formula of the universal law which has complete power over divine affairs as over human matters; and this is analogy." [129] For Grenet the essential aspect of the analogical method seems to be the " rediscovery of the same relation, the sign of a certain formal commonness, at a higher level." [130] He goes on to establish how analogy, being "similarity essentially mingled with dissimilarity, is specifically the law of knowing, being, and acting."

Grenet recognizes that " Plato has never explicitly stated that one of the conditions (requisite if the empirical properties of sensible realities are to be enabled to have a metaphorical meaning) is the similarity among relations." [131] It is evident that Plato made use of the metaphor; he has a very profound understanding of it. [132] There is no doubt that certain metaphors in the dialogues are really philosophical analogies, [133] as is patent in the following segment from the *Republic:* " Let us transfer what we have discovered in a well-organized State to the individual. If there is agreement, perfect; if not, we shall return to the State." [134]

But can one say that there is a scientific use of a deliberate

[129] P. Grenet, *Les origines de l'analogie philosophique dans les dialogues de Platon,* editions contemporaines (Paris: Boivin, 1948), p.

[130] Grenet, *op. cit.,* p. 115, n. 394.

[131] *Op. cit.,* p.

[132] Cf. Pierre Louis, *Les metaphores de Platon* (Paris, 1945).

[133] Cf. Plato, *Timaeus,* the metaphor about the artisan.

[134] Cf. Plato, *Republic* IV, 434D: let us transport it; likewise *avatf>ep6vres* VI, 484C; *avaKeTaL* IX,

and precise analogy in Plato? Usually Empedocles is considered to be the clearest witness of the transition from literary, metaphorical analogy to scientific analogy.[135] Among the physiological philosophers prior to Plato, analogy seems to be the requisite procedure for representing facts and realities which escape immediate observation, this procedure becoming apparent once there is philosophical reflection, at least *in actu exercito,* since *in actu signata* the situation is quite different.

To make a truly useful comparison between Aristotle's use of analogy and that of his teacher, we must give an account of the fact that analogical knowledge, or the analogical method, is situated at various levels. In fact, analogy seems to have its origin in Greece in the area of poetry, namely, the metaphor. Here we are in the presence of what is called *literary* and *poetic* analogy, a descriptive analogy which seeks to elucidate certain human situations.

Within the scientific domain, analogy undoubtedly first becomes explicit in mathematics. Is it not the similarity among relations that serves as the best means for identifying the differential? In biology it develops very efficaciously; one finds it in works produced before the time of Plato and Aristotle. In Aristotle it is discerned also in the domain of first philosophy. Is it not in his works that one first encounters analogy in the domain proper to the examination of being itself?

One can say, then, that Plato uses analogy in a non-original way, in the sense that he uses the discoveries of his predecessors, especially the Pythagoreans, the physicians, and the biologists,[136] and adapts them to his dialectical method. Furthermore, he rarely uses the terms *analogue* and *analogy* while making frequent use of the terms *E7Tavacpep0fLEV, avacpEpOV'T€<;.* The verb *to transport* manifests this movement of the mind

[135] Cf. 0. Regenbogen, "Eine Forschungsmethode antiker Naturwissenschaft," *Quellen und Studien zur Geschichte der Mathematik, Astronomie und Physik* (Berlin, 1931), pp. 145-148. Cf. also H. Diller, "Olf;<s *rwv aa>)AWV ra <Po.<vop,evo., Hermes* (Berlin, 1932).

[136] Cf. Grenet, *op. cit.,* p. 131 sq. nn. 449 and 450. Cf. Delatte, *Essai sur la politique pythagoricienne,* pp. 67-70, 91-109, on the role of *avo.Ao-ylu.* in the Pythagorean definition of justice.

passing from one domain to another and transferring the relation discovered in a given domain to another domain.[137] Whenever Plato uses the terms *analogue* and *analogy*, he does this to signify a unity of relations. Analogy has a unifying power, as is very clear in the great passage on *avaAoy£a* (*Timaeus* 31 C). The same relation exists between fire and air, air and water .... Grenet makes the following accurate observation:

> In Plato's mind, this established relation is not wanting in presenting a certain relationship with Form, the *E%do8*, since it must be mentioned that law and order in *PhilebU8* (fl6 B) have a singular resemblance to order in *Gorgias* (503 E), all of which were identified with the Form and the *E%do8.*[138] As a result we have to affirm that Plato was not explicitly aware of the proportional structure of philosophical analogy.[139] It cannot be denied that he makes a mathematical use of analogy in *TimaeU8.*[140]

However, Grenet holds that Plato made the distinction between mathematical and philosophical analogy.

Aristotle further develops his predecessor's discovery and gives it a new status, inasmuch as the Philosopher perceives this similarity of relations, not only on the level of visible qualities, vital functions, and quantitative properties, but also on the level of the very structure of *what is*, the level of the division of being. For Plato, analogy remains on the level of forms and vital functions; for Aristotle, it reaches being and the principles of being, movement and vital functions. Analogy is no longer thought to be primarily a method promoting the manifestation of formal commonness among diverse realities of various levels, as seems to be the primary meaning for Plato; it is principally the fundamental structure of *what is;* the real *avaAoyov* is something beyond the (at least virtual) multiplicity of experienced reality, it implies an *order towards* what unifies it, that is, towards its act. This is why analogy is

[137] Cf. what Dies calls the" Platonian transposition," in *Autour de Platon* (Paris, n, p. 401.
[136] *Op. cit.*, p. 139.
[189] *Op. cit.*, p. 148.
[140] *Op. cit.*, p. 154.

primarily expressed by the *termavaA.oyov.* The methodological aspect is secondary precisely because our mind cannot intuitively grasp this unity and multiplicity of *that which is,* inasmuch as it grasps them only by analyzing (inquiring into various proper causes) and by unifying these diverse analyses.

II. ARE "TERMS WITH A MuLTIPLE MEANING" ANALOGous TERMS?

To improve our understanding of the meaning of *analogue* and *analogy* in Aristotle, let us try to see if the Philosopher considers as analogous *terms which are said in many ways* in virtue of a same origin or a same end. The question is raised since Aristotle himself does not treat it explicitly.

Let us cite here several excerpts wherein Aristotle presents his thought most clearly concerning terms *said in manifold ways,* as well as delineate the ultimate signification of the various meanings of these terms.

Organon

We shall first examine the Philosopher's definitions of *homonyms (op,6Jvvp,a)* and *synonyms* at the beginning of the *Categories:* "A homonym is said to be that of which only the name is common and the concept signified by this name has a different nature." [141] " Animal " for instance, can signify a man or a certain painting. The existing man and the painting of the man have only the name in common, the name can designate either the one or the other. Here we are in the presence of *equivocal* terms, namely, terms which have entirely different meanings but nevertheless. keep the same name.

" That is called a synonym of which the name is common and the concept expressed by this name has the same nature." [142] "Animal" is at the same time a man or a cow. Man and cow can be expressed by the same name and both have the same substantial notion. Here we are in the presence

[1"] *Categories,* I, la [149] *Ibid.,* la 7.

of *univocal* terms, namely, terms having similar meanings. Between these two extremes the Philosopher recognizes the existence of *paronyms.* [143]

In the *Categories* Aristotle does not add any further distinctions, and this is correct from the vantage point wherein he places himself (the aspect of attribution, of . The first major distinction to be made is between equivocal and univocal terms, since every term has a proper meaning which is manifested in a particular name. By this very fact some things have a common name with totally different meanings, while others can have common names with common meanings.

In the *Topics* the Philosopher asks: ' Must the good be examined as a term said in manifold ways (1r>.eovaxwc;-)?

For if it is said in many ways, its opposite (evil) , too, will be said in many ways, as the fact of not-seeing is said in manifold ways, one being the fact of not having sight, the other the fact of not exercizing it. If the fact of not seeing is said in many ways, the fact of seeing is also necessarily said in many ways. Likewise, as regards realities existing according to privation and *habitus,* if one is said in many ways, so will the other, as the fact of sensing is said in a manifold way as applied to the soul and the body, the fact of being deprived of the ability to see, also, is said in many ways accordingly as it is applied to the soul or to the body. Likewise the just ... In the same way (O..,dvrw>) if healthy (r6 *tytnv6v)* is said in several manners, then healthily (r6 *tytnvw>)* will also be said in many ways; now the healthy is on the one hand what produces (r6 *71'0t'1JnK6v)* health, on the other hand what preserves (r6 *tf;vAaKnK6v)* it, what betokens (ro *0"'1Jp.avnK6v)* it; and" healthily" (*r6 tymvw>)* will also have the same meanings. Similarly *(bp.olw>)* this applies to other terms, when the same name is said in several manners, even the *case* (7rrwm>) of this name (a7r' *avroil)* will be said in many ways .... " [144]

Finally the Philosopher specifies:

The *good* in food is what produces pleasure; the good in the art of medicine is what produces health; in the soul, it is the fact of a certain *(7rotav)* [quality], temperate, strong, just; similarly *(bp.olw>)* in man. This is why the good is *homonymous.* [145]

[143] *IIapwpvp,a* (Latin translation: *denominativa).*
[144] *Topics* I, 15, 106b 17-19.
[145] *Ibid.,* 107a 5.

This text of the *Topics* is very clear and plainly shows what the Philosopher understands by the expression " a term *said in a manifold way."* Such a term is indeed a *homonymous* term, in the sense that it is not a term said in one way, having only one meaning. Yet it is not a matter of merely homonymous term, since the Philosopher emphatically states: " If it is said in many ways, so will its opposite." This indicates that these various meanings imply a certain order, and the matter becomes even more explicit with the example concerning "healthy": first when the Philosopher says: "If *healthy* is said in many ways, so also *healthily,"* then when he explains that *healthy* is, on the one hand, what produces health, on the other, what preserves or indicates it, etc .... This variety of meanings, then, implies diverse relations having something in common, that is, the same term.

Philosophy of Nature

In his philosophical studies about nature and the living thing, Aristotle constantly explains his understanding of the homonym.[146] Beyond univocal terms there are terms which are said in a manifold way, having various meanings.

At the beginning of the *Physics* the Philosopher discusses being and says: " since being is said in a manifold way (TToA'Aaxws)," [147] "since *one* itself is said in many ways" (TToA.-*A.axws)*,[148] " --- Parmenides is mistaken since he views matter absolutely (aTTA.ws) whereas it should be viewed manifoldly" *(TToA'AaKws)*,[149] One can say that Aristotle's great discovery as concerns Parmenides was his discovery that what exists is manifold in its very being (TT'OAAU *eiva£ ra 6vra).* Not only *being* and *one* are said manifoldly but so also is *nature:* "Nature is said in a twofold way" Uhxws)[150] (the Philosopher

[146] Indeed, if these realities are to be comparable *(<Tvf-'f3A7Jr&.),* they must not be homonymous. They are comparable to the extent that they are homonymous. Cf. *Physics* VII, 4, Q48b *5.*

[147] *Physics* I, *Q,* 185a QO.

[148] *Ibid.,* 185b *5.*

[149] *Ibid.,* 8, 186a Q4-25.

[150] *Ibid.,* II, *Q,* 194a 12. Cf. 1, 148a QS; 198b 19; 8, 199a 80; IV, 11, Q19b 6.

also uses the term *7TocraKwr;* in reference to the various meanings of nature) .[151] The end is taken in two senses.[152] The causes also are said according to various meanings: "in one way (Eva ... *Tp67Tov)* a cause is said to be that of which reality is made ... in another, it is the principle of movement ..." [153] (the causes are said in a manifold way [7ToA.Aaxwr;]).[154] The infinite is said manifoldly (7Tocraxwr;);[155] the fact of being in power is said in various ways (7r'A.eovaxwr;),[156] the first also is said in various ways (7T'Aeovaxwr;).[157] Non-being is said in various ways (7T'Aeovaxwr;);[158] the unity of movement is said in many ways (7To'AA.axwr;).[159] To express the quality of these notions and these terms, it is easy to observe that Aristotle sometimes uses *7To'AA.axwr;,* sometimes *7Tocraxwr;,* sometimes 7TAE0-*vaxwr;*. Are there reasons for the choice of one or another of these terms? [16] It seems that we can specify that *7ToA.Aaxwr;* expresses a more qualitative diversity, *7Tocraxwr;* a more quantitative diversity, and *7TAEovaxwr;* a more numeric diversity of plenitude; but we should not try to be too specific in a domain where Aristotle seems to interchange these expressions rather easily.

In the *De Anima* we again encounter this need to specify the various meanings of the terms used in the *Physics.* For instance, *entelechy* is twofold (8txwr;),[161] finality is twofold *(8tTT6v, 8tTTwr;);*[162] substance is threefold *(Tptxwr;);* [163] the one

[151] *Ibid.,* II, 2, 193b 22: f1.„d 1'1€ *l'itwptcrTaL 1rocraxws 7}* ¢verts *Xl.'yerat.*

[152] *Ibid.,* 194a 35.

[153] *Ibid.,* 3, 194b 23 sq.

[154] *Ibid.,* 195a 29.

[155] *Ibid.,* 4, 204a 2; likewise IV, 3, 210a 14 concerning liXXo *lv liXX11.*

[156] *Ibid.,* VIII, 4, 255a 31; cf. 4, 255b 17: "The power of the light and the heavy is understood under many aspects (.,.oXXaxws)."

[157] *Ibid.,* 7, 260b 17.

[158] *Ibid.,* V, 1, 225a 20.

[159] *Ibid.,* 4, 227b 3.

[160] In the *Parts of Animals* we constantly find *1rXeovaxws* and *1roXXaxws* as opposed to *{f..,.Xws.* Cf. III, 648b 11 and 649b 10 concerning the dry and the humid.

[161] *On the Soul,* II, 1, 412a 22.

[162] *Ibid.,* 4, 415b 2 and 20; II, 8, 419b *5;* III, 2, 426a 7-8.

[163] *Ibid.,* II, 2, 414a 14-15; 6, 418a 8.

and being are manifold *('TT'A.eovaxwr;);*[164] life is manifold ('TT'AE0-*vax&r;);*[165] principles and causes are manifold *('TT'oAA.axwr;)*.[166] These adverbs *(8txwr;, rptxwr;, 'lT'Aeovax&r;),* which qualify the manner in which these terms are communicated and expressed are primarily opposed to *a'lT'Awr;,* namely, the absolutely simple manner in which a term can be stated.[167] At the same time, they show that these terms are not simply homonymous, since their various meanings can be specified, and this enables philosophy to make use of them.

First Philosophy

We know how important a role terms *said in many ways ('TT'oA.A.axwr;A.ey6p,eva)* play in the *First Philosophy,* wherein the Philosopher devotes a whole book to the enumeration and ordering of their various meanings;[168] this is what is very significant. As he has already stated in the *Physics* and the tract *On the Soul,* the Philosopher again insists: Causes are said in manifold ways ('TT'oAA.ax&r;)/[69] as also are having[170] and being[171] (this diversity of being implies both accidental being and being *per se).*[172] What is true of being is true of the one and the good, which are said manifoldly.[173] Furthermore, diversity has the greatest extension in relation to them. For substance, on the contrary, the manifold manner *('TT'oA.A.axwr;),* which is no longer explicitly formulated through diverse meanings, is reduced to two modalities *(Kartt 8vo rp61T'ovr;).*

Speaking about being in Book r, Aristotle makes explicit his understanding of this diversity of meanings: "If being is said in various ways, this diversity is not a pure diversity, since it is

[164] *Ibid.,* 1, 412b 8-9.
[165] *Ibid.,* 2, 413a 22.
[166] *Ibid.,* 4, 415b 9.
[167] *Ibid.,* 5, 417b 2 and 30.
[168] Book A is called IIepi *TWV* 7ro<raxws *'J..eyopi.vwv.*
[169] *Meta.* A, 2, 1013b 31 sq.; cf. *Physics* II, 3, 195a 29 sq.
[170] *Meta.* A, 23, 1023a 8 sq.
[171] *Ibid.,* 1, 1028a 10.
[172] *Ibid.,* 7, 1017a 7 sq.
[173] *Ibid.,* r, 2, 1004a 22-31. Cf. *Meta.* I, 2 and 3, 1054a 13, 32-33. Aristotle recognizes that the "same" has various meanings (7roA'llaxws) as well as the " other " and the " dissll:nilar."

ordered to some one thing, to a certain nature *(1rpor; ɐV Kat }Ltav nva cf>vaw)'* which enables this diversity to state that being is not said equivocally *(ovx OJLWVVJ.Lwr;)*." [174] And again we encounter the example of the healthy and the medical, quoted earlier in the *Topics,* which illustrates this kind of diversity: As the various meanings of healthy are all said in relation to health, "the one because it preserves it, the other because it produces it, the other because it is a sign of health," so also all the meanings of the medical are ordered to medicine: " The term *medical* is applied either to what possesses the art of medicine or what is connatural to it or what is its function. Thus being is said in various ways, but all these meanings are said in reference to one unique principle, namely, substance; some express substance, others the determination of substance, others the completion *to* substance." [175] To indicate that this diversity is not merely equivocal diversity but a variety *ordered to a certain principle* which measures, determines, and limits it, Aristotle uses these expressions *1Tpor;* ɐV, *1Tpor; TO awo,* [176] *1rpor; TaVTO 0 EKaCTTOV,*[177] *1rpor; fJ-taV TtVa ·ÿVCTW,*[178] *1Tpor; fJ-taV*

In some cases he uses *KafJ'* ɐV [180] to underline the relationship of *1Tpor; J.Ltav cf>vcrtv* and of *KafJ'* ɐV; and of *KafJ'* ɐV n *Kat Kowov;* [181] in other cases he opposes *1Tpor;* ɐV to *KafJ'* ɐV.[182]

[1]··· *Meta.* r, 1003a 33-34.

[176] *Ibid.,* 1003a 33 sq. Cf. also 1004a 1005a 6 sq.; e, 1, 1045b sq. and 1046a 10.

[176] *Ibid.,* Z, 4, 1030a 33 sq. Aristotle speaks of the "medical" which is relative to one and the same thing but is not, in itself, one and the same thing and therefore is not said to be *Of.'WPVf.'WS.*

[177] *Ibid.,* K, 3, 1061a 3 and 1061b "And since everything existing is *KafJ' TL Kal KOLPOP.*

[178] *Ibid.,* r, 1003a 33-34.

[179] *Ibid.,* 1003b 6. Again it is a question of being: To *ilv XryeTat ?ToXXaxws.*

[180] *Ibid.* 1003b "There is a science, not only of those things which are said *KafJ'* but even of those things which are said *1rpos f.'lav <f>viJ'tP;* for these things themselves in a certain way are said *KaO'*

[181] *Ibid.,* K, 3, 1061b Speaking about the philosopher who treats various realities insofar as they are beings, Aristotle adds: " and ... although everything existing is said *?ToXXa.xws,* yet it is said *KaO'* n *Kal Kotvov."*

[182] *Ibid.,* Z, 4, 1030b 3: " The term 'medical' is said neither of the body and the function and the instrument nor homonymously nor *Ka.O' Ilv* but *1rpos* ɐV."

Whenever being is concerned he uses *-npor; ev* and *KaO' ev n*, the latter specifying the former, and when speaking of the *medical* he states that this term is said neither equivocally nor according to some one thing *(KaO'* ev) but towards some one thing *('TTpos Iv).*

What difference is there between being *ordered towards* ('TTpor;) a single principle (for being, substance; for the medical, health) and being *according to* (KaO') some one thing (for being, substance)? To be ordered *towards* a single principle can be achieved in reference to a principle-measure which unifies diversity only externally, whereas being *according to* some one thing requires that some one thing be immanent and that it unify diversity internally. If this distinction is correct, we can say that diversity possesses something common in this latter case, but not necessarily in the former case.

Is this not what Aristotle seems to be indicating in Books K and r, when he asks whether there is a single science which studies being in all its universality? If being were simply equivocal, without anything common, it could not be studied by a single science.[183] Being, however, is not merely equivocal, since it is *according to* some one thing and it possesses something common *(KaO' ev n Kat Kowov) I* [84] Let us observe, however, that in the third chapter of Book K, immediately before the conclusion, Aristotle, with a view to explaining his thought further, uses the ordinary examples of the healthy and the medical. In reference to these two terms he uses the expressions *'TTpor; ravro* 8' *EKUU"TOV*[185] and *a'TTO rijr;* E'1TtCTT'IJf.I!YJS.[86] Then, considering being, he says: "Being is said of everything in the same way ... ,[187] since from everything existing, induction (*avaywy'lj)* leads to some one and common thing *('TTpor; ev n Kat Kowov)* ." [188] It seems that Aristotle uses *1Tpor; ev n Kat Kmvov* as well as *KaO' Ë'V TE ' KOWQV.*

If in Book Z, speaking about essence and quiddity and returning to the example of " medical," the Philosopher com-

[183] *Ibid.,* K, 8, 1060b 82 sq.
[184] *Ibid.,* 106lb 12.
[185] *Ibid.,* 106la 2.
[186] *Ibid.,* 106la 4-5.
[187] *Ibid.,* 106la 7-8.
[188] *Ibid.,* 106la 10-11.

pares the use of *1rpo<;* €v and *KaO'* €v to it, and accepts one but rejects the other, whereas in Book K he decides to use *KaO'* €v with being after using *1rpo<;* €v with "medical," is this a sign of delineation in his thought? One knows that Book Z was undoubtedly written later than Book K. Or can this difference be understood by reason of the subject matter? (In Book Z it is a matter of quiddity and substance, in Book K it is a question of being and the science of being) / [89]

As regards this *order to* a principle, we can specify that being taken in the *first sense,* in the *absolute sense,* " to which all the other categories of being are related (1rpo<; o), is substance. In fact, it is through the notion of substance that the other determinations, quantity, quality, and the other categories are said to exist, since they all imply the concept of substance." [190] There is, then, a certain *order* among these diverse meanings of being. If there is an order, there are relations. But then, are not these terms which are said in various ways said according to analogy? Aristotle does not explicitly say this.

Human Philosophy

In the *Nicomachean Ethics* the Philosopher seems to distinguish between this diversity of meanings ordered to or proceeding from one and the same principle of unity according to analogy. [191] We have already cited this text. The Philosopher distinguishes among the homonyms which happen by chance

[189] Book r is usually deemed to be contemporary with Book Z. This would indicate that it is not a question of evolution in Aristotle's thought but of different viewpoints. When it is a question of the critical aspect, namely, of justifying the unity of a science, then the *1rpos* rt, the *1rpos p.lav <f>vutv* is sufficient; one can use *1rpos* just as well as *KaO'* but when it is a question of the aspect of reality in its proper structure, it is different: the medical does not possess unity *KaO'* only being possesses it.

[190] *Meta.* e, 1, l045b !'l7 sq.

[191] In the *Eudemian Ethics,* Aristotle emphasizes that the various friendships cited therein are said, not according to the same meaning, not as species of the same genus, nor are they fully equivocal, but they are said according to analogy *(Eudemian Ethics* H, 3, 1238b !'ll); they are said in reference to one of them, namely, the first *1rpos r7}v 1rpwr1Jv* (H, 6, l!'l40b 39).

(&.1r0 *TVXTJ'>)* the homonyms which proceed from a single principle *(&.<{>' Ev6s)* or lean towards a single principle (1rpos ev) and finally the terms which are said *according to analogy.* He gives this example: "As sight is in the body, the mind is in the soul, another in the other." [192] When it is a matter of terms said according to analogy, the order existing among their various meanings no longer proceeds from an extrinsic principle, that is, an origin or an end; it is inherent.

As regards this text let us observe that Aristotle uses the expression *&.<{>' Ev6s,* which he does not use in his First Philosophy. This is understandable since, as regards being and the one, he has not made an inquiry about the common origin, inasmuch as he has not raised the question about creation, whereas the problem about the origin of the good can be raised, inasmuch as we ourselves are at the origin of the goodness of our activities.

On the contrary, the Philosopher does not use the expression *KaO'* ev, but from *1Tpos* ev he goes on immediately to KO.T(l. *&.va-A.oy[av.* Perhaps in writing the *Ethics* he has not sufficiently distinguished between *KaO'* ev and *1Tpos* EV and deems these two expressions to be identical. One can explain this omission by virtue of the concept under consideration, namely, the good. This concept cannot have a *KaO'* ev unity, since it does not refer to the formal cause but implies the final cause. **It** is easy to understand that diversity according to analogy and diversity according to some one thing are closely related, since both imply an inherent order; but this inherent order, when it is a question of unity according to analogy, does not as such imply something common but a simple similarity of relations (another in the other), whereas the immanent order expressed by *according to some one thing* necessarily implies something common.

This enables us to understand, on the one hand, that the diversity of terms according to analogy is the farthest removed from the similarity of univocal terms and the closest to the variety in equivocal terms; on the other hand, that this diver-

[192] Cf. *Nic. Ethics* I, 4, 1096b !1!9 (ClXAo *ev* Cl'A.'A.'lJ) and *5,* 1097a 17 sq.

sity has a special type of original unity which does not correspond to the unity of the various terms which are ordered to a single principle or proceed from the same principle, since the order to this principle or dependency upon a single origin can remain external. On the contrary, the properly analogical order, being a similarity of relations, is not external to diversity; but this analogical order does not explain the one common thing expressed by *KaO' ev* n. Aristotle, then, does not establish an opposition between terms with manifold meanings and terms according to analogy but distinguishes among *terms said in a manifold way*, terms proceeding from some one thing and terms ordered *to* some one thing, terms *according to* some one thing, and finally terms *according to analogy*. In other words, he specifically explains how, by implying a certain unity, the diversity of meanings in these terms avoids mere equivocation.193 This unity must be considered a unity proceeding either from a common origin, a common principle to which one is ordered, something common according to which one exists, or a relation or similarity among relations. 194

These various ways of considering *unity* in diversity do not necessarily exclude one another; on the contrary, they can complete one another yet remain distinct, each having its proper character.

198 There is no contradiction between *being said manifoldly* and *being said according to analogy*. Aristotle has explicitly recognized that the just is *analogous* and he also recognizes that the just has many meanings. This is what he says: " As a result, in most of these cases, if one group of terms is used in many senses, the opposite group of terms also will be used in many senses *(,.A.eovaxws)*. For instance, if the notion of the just bears many meanings *(1rA.eovaxws)*, the same will apply to the notion of the unjust. Now it seems that the term 'unjust' is understood in many senses *(1rA.eovaxws)*, but because of the proximity of these meanings (odt *T0 uvve"f"fV<)*, their homonymy (equivocation) escapes notice and their case is unlike that of notions which are removed from one another, so that their homonymy is more easily detected; for instance (since the difference is considerable when it refers to the external form), the univocal use of the word ' key ' to designate the bone situated at the base of the neck in living beings and the instrument which serves to lock doors" (Nic. *Ethics*, V, 2, 1129a 23-31).

194 Here one could undoubtedly rediscover the various causalities: efficient causality, the origin &.¢' *lv6s;* the exemplary causality, 1rpos *lv;* the formal inherent causality, *KaO'* the final causality, *KaT' &.vaA.o"flav.*

Let us carefully observe that, in all the parts of his philosophy, Aristotle speaks of terms said manifoldly and that, most of the time, he does not specify the way wherein the various meanings of these terms have a certain unity. He insists on the diversity of their meanings, then, to keep us from taking these terms equivocally. Especially in the First Philosophy he shows us how the various meanings of being and the one are ordered to a single principle, namely, substance. His purpose is to show that, despite their diversity, the meanings of being and the one can be examined by one single science, since they are all ordered *to* some one thing and are said *according* to some one thing.

In no way does this prevent the variety of meanings in being, under another aspect (the aspect of potency and act), from being thought to have only one unity in keeping with analogy. However, precisely because this consideration of being as act and of being as potency is taken from the aspect of its final cause, it is ultimate and, therefore, throws light on a final aspect in the diversity and unity of being. This seems to indicate that unity according to analogy is surely ultimate, since it is achieved within the greatest variety and reduces this diversity to a certain unity. Moreover, what Aristotle says about the good is very significant since the good is also being in act and under the aspect of the final cause. It is not surprising, then, that the various meanings of the good are said according to analogy.

'Ap6Tepov Kat VITTepov: the Previous and the Consequent

Since the problem here concerns specifying the kind of unity in diversity, we are facing a problem about order. Let us consider how Aristotle distinguishes the various orders; this will enable us to have a better grasp on the position of *analogue* in his philosophy.

Among the concepts stated manifoldly Aristotle lists the previous and the consequent. The *previous* and the *consequent*, however, specifically constitute an ordered diversity of which the terms are inherent, since the previous is not necessarily

the principle or what is first; it is the first under a certain aspect, but, inasmuch as it is related to the consequent, it remains in an ordered diversity.

Is this not exactly the characteristic of in which the manifold meaning is said according to analogy, in contrast to terms stated in reference to some one thing?

Following Aristotle, we should specify that the concepts implying the previous and the consequent cannot be defined.[195] They are, as it were, beyond genera and specific differences, and yet they are as though within principles. Being intermediate they enable the principles to be reunited. Here we cannot pursue a depth-study of the question concerning anteriority and posteriority, a very important one in Aristotle's philosophy; let us observe only that the previous and the consequent manifest to us the various ways in which the order of realities can be arranged and understood. The exigencies of the order of thought do not always correspond to those of the order of physical realities. Our thought is not a measure of physical realities, and yet it is not always totally submitted to them. In short, does not this ambivalent order require a knowledge according to analogy? Would this not safeguard a certain dependency of our knowledge upon reality, simultaneously proclaiming that it exceeds it?

In the *Categories* Aristotle specifies the various meanings of *anteriority* and *posteriority*.[196] The first and principal sense is anteriority according to time; previous, then, signifies the older. Second, anteriority is what admits no reciprocity in the achievement of the act of existing; previous in this manner is that whose achievement in being is not reciprocal. For instance, the number "one" is previous to "two"; if two exists, one exists, whereas if one exists, two does not necessarily exist. Third, the previous is said in relation to a given order; letters are said to be previous to syllables. On the contrary, the species which proceed from the division of one genus are opposed to each

[195] *On the Soul*, II, S, 414b 28: "There is no definition of the concepts indicating the previous and the consequent."

[196] *Categories* l!'l, 14a fl6 sq.

other; neither is previous, they are simultaneous by nature. Fourth, previous by nature is what is best (ro *f3eA.rtov),* it is what is the most estimable. In this sense, the natural cause is always previous to its effects; so is reality in reference to the true proposition. It is easy to grasp the various modalities of previous as the Philosopher explains them here. For us, the first modality is according to time, thence according to becoming or movement; it is the most evident. The second modality examines the structure of reality whose basis we seek, the primordial element, which, although presupposed by everything else, itself presupposes nothing. The third modality examines order and the fourth investigates finality.

Speaking about time in the *Physics,* Aristotle says: "First of all *(1rpwrov)* the previous and the consequent are in place." [197] This should be understood in the sense of position, whereas if the previous and the consequent are in magnitude, they are necessarily also in movement, by analogy with magnitude. But they are also in time, since time and motion are always related to each other. From another aspect, the previous and the consequent are in motion and, in reference to the subject, they are motion itself. Nevertheless, we can know time by determining motion, that is, by determining the previous and the consequent .... [198] We see how we must understand the previous and the consequent especially as they are in time. Really they first exist in motion, but they constitute time, the latter being the number of motions according to previous-consequent.

In the *First Philosophy* Aristotle again sets forth the various meanings of previous and consequent.

a. Previous and consequent are basically said " *according to the greater or lesser proximity of a principle* determined either absolutely by nature or in reference to some thing, some place, or certain persons." [199] This anteriority can be achieved according to place, time, motion, potency, order.

[197] *Physics* IV, 11, 219a 14.
[198] *Ibid.,* 219a 28.
[199] *Meta.* II, 1018b 10-12.

b. Previous and consequent are said *according to the order of knowledge,* either according to the the conceptual order (the universal precedes the particular, the simple precedes the complex), or according to sensation (the individual precedes the universal) .

c. Previous and consequent are said according to *properties (-mifJTJ)*. The properties o£ previous things are previous; the linear is previous to the polished.

d. Finally, the previous and the consequent are what according to nature and substance can exist independently o£ others; subject precedes accident, act precedes potency. In a certain way the other three meanings o£ the previous rely upon this last meaning.

One can readily see the various ways in which the diverse meanings o£ previous and consequent are set forth in the *Categories* and the *First Philosophy.* In the latter work there is a much clearer distinction between anteriority examined according to the various aspects o£ reality (according to place, time, motion, potency, and order) and anteriority as derived from our knowledge. Anteriority stated according to properties is necessarily secondary and relative, whereas anteriority according to nature and substance is the most fundamental and most essential; in a certain way it assumes all the others.[200]

Although act is first *A6y<y* and *yvW(]"Et,* it is preceded by potency in realities in the process of becoming; thus it is not first according to time. This is why the anteriority of substance implies all other anteriorities, whereas the anteriority o£ act does not imply all of them. Being what is ultimate in being, act is beyond time and becoming.

These various types of anteriority constitute various orders. I£ we first examine what *First Philosophy* tells us, it is easy

[200] Analyzing what substance is, Aristotle claims and establishes that substance is previous from the conceptual aspect (M-ycp), from the aspect of knowledge *(-yvwcret),* and, finally, from the temporal aspect (xp6vcp) (Z, 1, 1028b 32; 13, 1038b 27). In the *Categories* these various meanings are taken more generally, according to the diverse causalities: material causality (the becoming), efficient causality (the fact of existing), formal causality (order), final causality (the best).

to understand that the *first anteriority* constitutes an order towards *a single principle.* This indeed corresponds very well to diversity ordered to some one thing *1rpor; ev.* And *it is in reference to substance* that this ordered diversity exists ultimately.

The *second anteriority* considers the order of *knowledge.* This corresponds to the diversity ordered according to analogy as it is ultimately achieved *in reference to act.* This act possesses the ultimate anteriority in the order of knowledge.

But this order of knowledge can be understood also according to the genetic order. According to this order, we first discover the order achieved in time and based on motion and magnitude. This is why for us diversity according to analogy is first an arithmetical and geometric analogy. In pure quantity, the domain of magnitude and numbers, there is no diversity according to analogy; there is only division, which produces equality or inequality. However, there can be a certain analogical diversity by reason of motion and time and by reason of our knowledge as it orders movement and measures it. It is the first reflection of quality, the similarity of relations, in the domain of quantity.

The *third anteriority,* which concerns properties, corresponds to analogical diversity as this is achieved in reference to various vital functions.

Finally, the *fourth anteriority,* which is "according to nature and substance," is concerned with the order of existing realities. This anteriority truly corresponds to analogical diversity as it is ultimately achieved in reference to act. Act truly has the ultimate anteriority in the order of nature.

We should carefully advert to the truth that, although the anteriority of act and the anteriority of substance are according to nature, they are not identical. The anteriority of substance is necessarily an existential anteriority which implies the anteriority of act, whereas the anteriority of act does not always immediately and formally have the anteriority of substance (the ultimate act of a vital function is not a substantial being) , but necessarily presupposes it. As we have seen, how-

ever, for Aristotle only the diversity of being in act and potency is a diversity according to analogy, whereas the diversity of being in substance and accidents is a diversity *to a single principle.*

This enables us to specify that the ultimate metaphysical basis of diversity according to analogy is the anteriority of act over potency, [201] whereas the ultimate basis of diversity ordered to the one is the anteriority of substance over the other determinations of "that which is." The anteriority of act over potency, however, exists only *A6ycp* and *yvwrret.* Therefore, the ultimate analogical order is *A.6ycp* and *yvwrret,* namely, the conceptual level (the level of intelligibility), and the level of knowledge itself.

The order serving as the basis of diversity ordered *to the one* exists also on the existential and temporal level.

What difference is there between these various orders? Order on the conceptual level and the level of knowledge does not imply a *real and extrinsic principle,* whereas order on the existential level does imply it. This advances a better understanding of the domain proper to the analogical order.

In the order of concept and the order of knowledge the analogy of potency and act is something ultimate, the analogy of substance and accidents remains fundamental and Aristotle expresses it by *1rpor;; ev;* in the existential order substance is first and basic; act always presupposes it.

If we go on to examine the various anteriorities as they are presented to us in the *Categories,* we can easily see that the first, the one according to time, is reduced to the anteriority of knowledge according to its genetic aspect. The second anteriority manifests the existential aspect of the anteriority of substance; thus this anteriority is reduced to the first type explained above. The anteriority of the best is reduced to the

[201] If the ultimate basis of analogy is the anteriority of act over potency, nevertheless, for us *(quoad nos)* the first basis according to the genetic order of discovery seems to be the anteriority of motion and time which is based on magnitude. Between these two extreme domains there is the whole field of anteriority according to properties, to proper qualities. Is not this order the order with which the discovery of the analogy of vital functions is connected?

anteriority of act, and the anteriority of order is reduced to the anteriority of property.

The Relation between Analogy and Certain Ways of Reasoning

We have specified the proper meanings of *analogue* and *analogy*. Having examined the link existing between terms with manifold meanings and terms said according to analogy, and having investigated the basis of these terms, we must now mention the peculiar character of a certain reasoning of Aristotle, which seems to be analogical. We shall not be able here to quote all his reasonings of this particular sort; that would lead us too far. We have had to limit ourselves to the selection of a few very significant passages.

In the treatise on *Physics* Aristotle reasons in this manner:

> As (*wa1rep)* art is said of what is according to art and of what is artificial, so (ollrw) nature is said of what is stated according to nature and of what is natural. We shall not say that a bed is according to art, however, if it is only a bed in potency and does not yet have the form of a bed, nor shall we say that there is any art in it. The same is true of realities constituted by nature. Indeed, flesh or bone in potency does not yet have its proper nature and does not exist by nature inasmuch as it has not received the form of flesh or bone. I am referring to the definable form, which we express to define what flesh or bone is.... [202]

This comparison between nature and art gives all this reasoning a rather complex form; instead of two terms in the major premise there are really four terms, but between them there is a similarity of relations, which, through the use of art, promotes a better clarification of certain natural properties.

Aristotle sets forth this reasoning without using the terms *analogue* or *according to analogy* to characterize the connections between art and nature, but he makes use of such terms as wrnrep and *oiJrw* which certainly indicate a certain similarity of relations. Speaking about place in the fourth book of the same treatise, the Philosopher again reasons in this way: "It seems, indeed, that place is something like a vessel, the vessel

[202] *Physics* IT, 1, 198a 81-b

being a transportable place. The vessel, however, is no part of the thing. Insofar, then, as it is separable from the thing, the place is not the form." [203] This comparison between place and the vessel enables the Philosopher to have a better understanding as to why place is not the form of a thing.

One sees similar reasonings based upon the comparison of instants and points, [204] time and motion, [205] existence in time and existence in motion and place, [206] the composition of time and the composition of size and movement, [207] the division of time and the division of motion.

Let us not pretend that this kind of reasoning characterizes the works of Aristotle's youth and that later his philosophy uses a more formal and more rigorous logic. In the tract *On the Soul*, recognized as a work Aristotle wrote towards the end of his life, very similar reasonings occur even more frequently. We may simply note this:

Thus it is clear that if there is a common notion about the soul, the same applies to the figure; there exists no figure outside of that of the triangle, but the figures could be dominated by a common reason (A6yo'> Kotv6'>) which would be included in all (<i., €cpap *p.6cm* 1riicnv) but would not he proper (Z3o.,) to any figure; similarly (op.o[w.,) in the matter about merely enumerated souls . . . . [209] What the part of the soul is to the part of the body, the entire sensibility is to the whole of the body . . . . [210] In the same way that an eye is a pupil joined to sight, so an animal is a soul joined to a body . . . . [211] As (0a7r€p) sight is the sense of the visible and the invisible, so (op.olw>) hearing is the sense of sound and silence, and thus (oBTw) it is with taste, the sense of the tasty and the tasteless. [212] The soul is entelechy like (w>) science, since sleep and

[208] *Ibid.*, IV, sq.; cf. also VIII, 1, *(KaOrhrep* oih·ws).
[20·] *Ibid.*, IV, 10, 19 (wrnrep).
[205] *Ibid.*, IV, 11, n9b 9 (wrnrep).
[206] *Ibid.*, 17-18 (wrY7rep).
[207] *Ibid.*, VI, 1, 18 *(oflolws).*
[208] *Ibid.*, 4, (611olws); cf. also *5,* 16 *(oflolws);* 9, *(ofLolws);* VII, 3, *(bflolws);* VIII, 4, *5* and 10 *(oflolws).*
[209] *On the Soul* II, 3, 414b
[210] *Ibid.*, 1,
[211] *Ibid.*, 1, 413a 3-4; cf. also
[212] *Ibid.*, 10, sq.; cf. also 11, 10-11; 11, 17 sq.

awakeness require the presence of the soul. Now sleep is analogous to possession and awakeness to exercise. The anteriority according to the order of generation in the same individual, however, belongs to science. The soul, then, is the first entelechy of a natural body having life in potency .... [213] As *(wmrEp)* the nutritive faculty can be separated from touch and all sensation, so touch [can be separated from all other sensations] .... [214] As (!J:,a7r€p) the intelligence achieves nature in view of ... in the same way *(rov ai1rov rp61rov)*.[215] As *(wa7r€p)* action and passion are in the patient, so (oilrw) the act of the sensible and of the faculty reside in him who senses ... [216] If the fact of thinking is like (*wa1r€p)* the fact of sensing, it is therefore necessary ... [217]

These reasonings are indeed reasonings based upon a certain similarity of relations. This is why they are true analogical reasonings or reasonings according to analogy and manifest to us all the virtualities and dl the riches of the proper principles of which they make use. Although Aristotle does not use the word " analogy " in relation to them, the reality is sufficiently manifest for us to be able to consider them as such. This is important for a better perception of the place of *analogy* in the philosophical work of Aristotle, since it is through such reasonings that analogy appears as a rich source of research and discovery. It is a very different way of thinking from that which is attained through genus and specific difference and according to univocity. Instead of inquiring into the common and generic notion of realities, one considers the various modalities according to which the realities are presented to us.

Certainly this mode of reasoning already existed in Plato, but we may repeat here what we have said earlier. It seems that to Plato this manner of reasoning remained approximative, as an artistic comparison, whereas Aristotle uses it in a far more precise and technical way.

Thus in Aristotle we find analogical inductions and deductions, propositions implying analogical attributions and terms

[213] *Ibid.*, I, 412a 28 sq.
[214] *Ibid.*, 2, 418b 5-6.
[215] *Ibid.*, 4, 415b, 16; cf. also 5, 417b 4-5.
[216] *Ibid.*, III, 2, 426a 9-10.
[217] *Ibid.*, 4, 429a 10-17; cf. also 8, 482a 1; 12, 484b 18.

having various analogical meanings. Concerning the three operations of the human intelligence, then, we find a certain manner of expression which is no longer univocal and yet implies an ordered diversity; this diversity can be according to analogy.

This process of knowledge corresponds to the very nature of known reality, which in its being avoids all univocal classification. Being is not in a genus, nor is the one, the good, the true and the act.

This procedure is found again at various levels. Analogy is not identical in the *Philosophy of Nature* and the *First Philosophy;* this is normal, since the quality of attained reality is not the same. Hence the extreme difficulty we have in specifying and truly grasping what *analogue* and *analogy* are. Nevertheless, across this enormous complexity something common remains. The similarity of relations is perceived as a *diversity of meanings* implying an order, as a *diversity of attributions* implying an order, or as a *diversity within a reasoning implying a similarity of relations,* and this on the level of speculative philosophical knowledge or artistic or practical-moral knowledge.

III. ATTEMPT AT SYNTHESIS IN THE PERSPECTIVE OF AN ARISTOTELIAN PHILOSOPHY

Having examined the principal texts in which Aristotle explicitly speaks of analogy, having tried to discern how, on the one hand, *terms taken according to analogy* are an ultimate case among *terms said in various ways,* and how, on the other hand, the previous and the consequent are the basis for the meanings of these terms said in different ways, we must now make a last effort to try to understand how the great divisions of being into substance and accident, potency and act, the one and the multiple immediately lead us to the problem about analogy in its most fundamental and primordial aspect. From there we can make a genuine attempt to grasp the fundamental intuition of the Philosopher on the problem about analogy. In fact, the human intellect discovers itself in what is its greatest

possession, namely, the grasping of *that which is* insofar as it is *being;* the human mind can have a perfect discovery of itself in what is the deepest within it only by starting with this knowledge. That is why its proper procedure for grasping realities in their most qualitative aspects can be unveiled and manifested only by specifying the way whereby it grasps *that which is* insofar as it is being and the manner wherein it expresses this understanding.

However, the human mind does not have a precise understanding of *that which is* insofar as it is being through intuition; if the mind had this understanding through intuition, metaphysical researches and analyses would be useless, all metaphysical knowledge would then be reduced to simple intuitive consideration. Yet the human mind does not perceive *that which is* insofar as it is being as a genus, not even as the most universal, the most common, the most abstract, the supreme genus, the one which, containing all realities, would admit of their classification. This is impossible, since nothing exists outside being; if such a genus existed, it could have no specific difference, which by determining being would contract it. Being cannot be contained within a genus, for it revolts against the potential and radical limitation pertinent to genus.

Our mind, then, can attain all the richness of *that which is* insofar as it is being, only by seeking to discover the proper causes, namely, by analyzing *that which is.* If the mind rejects this analysis through proper causes, it must then be content to describe *the fact of existing* as it is in reality *or* as it *appears* to our judgment concerning existence, when we say " this is " or " this is not." From that very moment the mind seeks only to specify what is given, the fact (Positivist attitude) or the " tissue of relations in which the fact of existing appears " (Phenomenologist attitude).

The desire to discover the proper causes of *that which is* insofar as it is being can be fulfilled only through and in a philosophical induction. Only philosophical induction enables us to grasp the proper principles, beyond *the fact of existing* or the *appearance* of the fact of existing. All philosophical in-

duction, however, implies certain experiences and certain questions. Philosophical induction arises from the cooperation of certain experiences and certain questions. Hence there is a preparatory phase to all philosophical induction, this phase being pre-philosophical but nonetheless essential.

In fact, for Aristotle there is an induction which makes us discover *substance,* as principle and cause according to the form of *that which is (Meta.* Z, chap. 17) and an induction which leads us to discover *act* as principle and cause according to the end of *that which is.* In the First Philosophy there is no discovery of matter as the proper constitutive principle of *that which is,* precisely because matter is immediately the constitutive principle of nature, the proper principle of what is in movement; it can be the principle of what is only mediately through the intermediary of becoming and form. Likewise in the First Philosophy there is, properly viewed, no discovery of the efficient cause as proper cause of *that which is* precisely because the efficient cause is the proper cause of becoming and not of *that which is.*

The discovery of the first, immovable Cause is the discovery of the *ultimate* cause of what is moved, of what moves, and not the discovery of the proper cause of *what is.* That is why the only two proper causes of *that which is* are substance and act; there can be no others. *The one* is discovered as a property of *what is,* it is no longer seen as a proper cause of *that which is.*

To grasp substance as cause of *that which is* according to the form implies a separation of substance in reference to all secondary determinations, the accidents. This separation is achieved on the level of being, for if substance is primarily *what exists,* accidents, quality, and quantity are *that which is* in a secondary way. That is why this understanding of substance achieves a certain division of *what exists.*

We can reason in the same way about perceiving act as cause of *that which is* according to the end. This understanding implies a separation of act in reference to potency, and thus also a division of *what exists.*

These two divisions (substance-accidents, act-potency) are

irreducible and necessarily determine the mind in two different ways. The division of *that which is* into substance and accident comes first; it is a division according to the order of determinations. Discovering being in that which is the source of everything, in what is entirely first, the mind discovers itself in its most basic exigency of intelligibility. Everything possessing a determination, a quiddity, is its good, capable of perfecting the mind.

The division of being into potency and act is completely different; it necessarily determines the mind in a fully different way. The distinction between the one and the multiple presupposes the other two divisions of being, since, properly considered, it is not a question of grasping a proper cause of *that which is* but of making explicit a property of *that which is.* That is why this last division of being into the one and the multiple makes the preceding two divisions explicit and manifests all their richness and all their power but no longer determines the mind in a new and original way. It does, however, promote unfolding of some of its richness according to various modalities of the two preceding divisions, while presupposing them.

How Does the Division of *Being into Substance and Accident Determine the Mind?*

This division, which is made from the research into the essential determination of *that which is,* specifies its primordial determination. It puts us in the presence of the first mode of *that which is,* namely, substance. Being is primarily substance, the radical principle, the source of all determinations of *what exists.* The accidents are only secondary beings relative to substance. Although they have their quiddity, their proper form, in their being, however, they remain essentially relative to substance. They exist only through substance, only through substance can they be defined; substance is included in their definition. Hence being will be said in various ways in reference to substance, quantity, quality, or relation. For in reference to substance, being is said primarily and absolutely,

whereas in reference to quality it is said relatively to substance. Quality is being because it is the disposition of substance, quantity because it is the measure of substance. . . . Hence it is relative to substance that accidents, these secondary determinations, are said to be.

Through this discovery of substance, the cause according to form of *that which is,* and of accidents, secondary determinations of what exists, the mind grasps being in a diversity which is determined and ordered within *that which is.* All the determinations of being, then, appear as relative to a first determination, a first principle which orders them. The diversity and the unity of being are then expressed according to an *order towards* a *first (1rpoc;* ev). In the midst of the diversity of determinations, the latter maintains a fundamental unity. All accidents are said to exist by virtue of their order to substance, and substance is said to be *per se.*

We are in the presence of a very special type of attribution, which is neither univocal nor equivocal, but intermediary between these two extremes in the sense that the same term " being " is attributed to substance, quality, and relation, but in different ways, each time with a proper meaning. However, the diversity of these meanings is not absolute, for there is an order. Only one of these meanings is first and remains independent of the others; these, on the contrary, are essentially relative to the first and imply it; in this sense there is no pure equivocation. This is what Aristotle calls the homonymy *1rpoc; eV.*

How Does the Division of Being into Potency and Act Determine the Mind?

This division, as resulting from the research into the purpose of being, specifies *that for the sake of which what is* exists. It manifests the proper term of *that which is* considered as being. It puts us in the presence of the other first mode of *that which is,* namely, act. Being is primarily act, as it is substance. Act is the ultimate principle and proper purpose of *that which is;* being in potency is an imperfect state of being, a state which

makes sense only in reference to an act; it remains essentially dependent upon act. Being in potency is intelligible only through its act. Being in potency cannot exist by itself *(per se)*, it does not *exist* in the absolute sense, it exists only *through* its act. Being, then, is said in diverse ways in reference to potency and act, for it is said of the one absolutely, of the other in an essentially relative manner. Being is said to be potency in relation to act; potency is truly being through act.

Through this induction from act, the cause according to the purpose of *that which is,* the mind grasps a new division of being; it grasps a new diversity and unity of being, namely, being in potency and being in act; being in act is being *per se,* being in potency is a relative being. However, let us carefully observe that here it is no longer a question of a diversity of meanings ordered towards a first, but of an essential order of one term towards another. This essential order is expressed in a relationship between one and the other. Although in certain cases this relation can be reciprocal, it is not in itself, since being in act does not depend in itself upon being in potency, although a given being in act can depend upon a given being in potency (the vital function in relation to its faculty, for instance). Considered in itself, act does not appeal to potency for existence, it *is* act immediately and *per se.* As act, it is, whereas potency appeals to act for existence; being in potency is being only in its order towards act, it is essentially a relative being.

In other words, the order among a given accident, quality, and substance, and the order between potency and act do not have the same nature. Between quality and substance, there is a quidditative and essential order of subordination, of a secondary determination of *that which is* in reference to a fundamental and primordial determination. Between potency and act there exists an order of essential dependency in reference to exercise. Being-in-potency depends essentially on being-in-act in the very exercise of its being.

The order of subordination of quality to substance is in line with the cause according to form, the order of dependency of

being-in-potency in reference to being-in-act is in line with the cause according to the end. This is why the dependency of being-in-potency in reference to being-in-act is more ultimate and therefore less intelligible to us. It is no longer a question of a quidditative dependency, since being-in-potency can possess the same quidditative intelligibility as being-in-act (for instance, essence and its act of being) , but of itself it remains in a state of dependency *of being*, not *of form* (quiddity). Being-in-potency as being-in-potency exists only in view of an act. Only an act exists in an absolute way.[218]

Since our mind grasps all that it apprehends through a quidditative mode, we can understand how, unless it raises itself " above " the apprehension which continues its function and does not remain enclosed in its proper manner of grasping the real, it will no longer be able to penetrate this new division of being into act and potency. It will pretend that this division of being in reality is simply a distinction of reason corresponding to different and successive states of the same reality; being in potency is simply the abstract aspect of being in act, which alone is the experienced concrete reality.

Hence we understand the increased difficulty for our mind to express and manifest this second division of being, since act in all that is totally proper to it cannot be grasped quidditatively; it is grasped in its exercise or in its result. The act terminates but does not structure. The act is not first to us, it is not what is fundamental but it achieves, it is what is ultimate. Its proper intelligibility can be expressed only as something ultimate, towards which we reach and beyond which there is nothing. This is why this second division of being can no longer be expressed immediately, in what characterizes it, according to " an order towards a first," since this order towards a first implies an order of determinations, an order of quidditative dependency. This second division of being is situated at another level inasmuch as we grasp act only in a

[218] The dependency of accident upon substance is simultaneously quidditative and existential; it is the dependency of a relative form upon its proper principle.

judgment and express it grammatically through a verb.[219] This verb always implies composition or division in its subject. If there were not this first relation of subject to verb, no further attribution would be possible. Furthermore, this second division of being into potency and act is expressed according to a relation, an *analogy.* And with a view to a better manifestation of this intimate and original relation, various examples are used: possible being is to being in act as he who can build is to him who builds, as he who can see is to him who sees, as he who can contemplate is to him who contemplates . . . One can say, then, that the *relation* is manifested in a *proportion.* If, in fact, this second division of being was expressed like the first through the statement: being is said of being-in-potency in a secondary and relative manner, it is said of being-in-act in a principal and primary manner, one would no longer manifest what characterizes this division of being and would pretend that it has the same value and same meaning as the first, the division into substance and accident.

To express the originality of the division of being into potency and act, one uses the relation existing between him who has the faculty to see and him who sees, since this relation is like the relation between potency and act. He who has the faculty to see is, indeed, essentially ordered to sight; this is the proper aim of the faculty to see. If one has the faculty to see, this is *in order to* see. One thereby manifests the special relation existing between being-in-potency and being-in-act, by using two realities which, better known to us, have the same relation.

These two irreducible divisions of being bring us into the presence of two distinct orders, orders which, however, are not foreign to each other, since these *two* divisions are a division of being. Hence they can be compared. While simultaneously respecting their irreducibility, one can specify their similarities and underline their divergences. For instance, one can say immediately that substance is act, whereas accidents always

[219] The verb primarily signifies action.

imply a certain potentiality, but one cannot thereby say that act is substantial and that all potentiality is accidental. There can be a substantial potentiality and there can be act-accidents (the immanent vital functions are second acts, ultimate as acts, but from the entitative aspect they are accidents) .

One could specify similar relations among the various meanings of being expressed according to the order to a single principle and those which are said according to analogy. Yet these two diversities of being will always remain irreducible for us, since our mind does not measure being but is measured by it. Our mind does not impose its method upon reality; rather reality is the basis of its method and thereby structures our mind.

The Extension of Analogy through the Distinction between the One and the Multiple

The distinction between the one and the multiple, which is, as it were, a consequence of the preceding division, enables us to have a better understanding of these two types of basic divisions and the ways for expressing them *(11'por; ev, &.vaA.oyia).*

Indeed, the one and the multiple are like properties of being and its divisions; by this very fact they make more explicit for us the order and the relation existing among the various modalities of being, the fruits of these divisions. Although the one adds nothing to being, it nevertheless manifests for us the indivisibility of that which is; by this very fact it gives being greater intelligibility. If, then, we consider the division of being into substance, quality, quantity, and relation under the aspect of the one, we can affirm that only substance is perfectly one, whereas quality, quantity, and relation are not perfectly" one," they are " one " relatively to the perfect and substantial " one." Their unity is ordered to this first " one." That is why, with accidents, there immediately appears the problem of multiplicity and number. If substance is essentially one, accidents are essentially multiple, not only because in a single substance they necessarily are diverse but also because they are complex in themselves. As the second mode of being, accident is never simple.

In this perspective we see how the one is said of substance and accidents in the same way as being is said of them, namely, according to an order to the first *{-rrpo<; lv)*. Accidents are to be" one" by reason of their essential relation to substance, the primordial one, whereas the one as a substance is said in an absolute way.

Is there a difference between the diversity of the being-accident in relation to the being-substance and that of the multiple-accident in relation to the one-substance? Is the *1rpo<; lv* of accidents in relation to substance the same as that of the multiple in relation to the one?

The accident appears more intrinsically *being* than it appears *one.* We can say that it is *being* according to a secondary modality, whereas it is *one* only according to its proper intelligibility (its abstract form) , since according to its proper existence and its concrete nature it is multiple; therefore it is one according to *intention* and not according to *esse.* By this very fact the attribution of the one to the multiple-accident tends to imply merely an extrinsic denomination; the multiple is one. This attribution is legitimate because of the essential order of the multiple to the one, but the multiple is not intrinsically and formally one. It is one extrinsically inasmuch as it is measured by the one; hence it is named as such by reason of this order to its measure.

Under the aspect of the one and the multiple, then, the diversity of the ordered attribution *(1rpo<; lv)* acquires a new extension. It is applied to all the terms having various meanings which, however, are not equivocal precisely because those meanings are variously related to a primordial meaning playing the role of measure, without any consideration as to whether these terms intrinsically or only extrinsically affect the realities to which they are attributed.

If we now examine the division of being-in-act and being-in-potency under the aspect of the one and the multiple, we can say that only act is perfectly one (like substance), whereas being-in-potency is not. It is relative to this first "one," namely, that of act, perfectly one. The unity of being-in-

potency is ordered to this first unity. With potency, too, there immediately appears the problem about multiplicity. Potency is the radical source of all multiplicity, all number, inasmuch as potency limits and contracts act and thereby particularizes and multiplies it. As the second mode of being, being in potency is never indivisible.

In this perspective we see how the *one*, like being, is said of *act* and *potency* in the sense that the one which affects being-in-potency essentially depends on the one which affects being-in-act. Being in potency is said to be " one " only by reason of its order towards being in act, this order giving it its unity. Being in potency, then, is one only through act; it is indivisible in itself.

Furthermore, the relations of the multiple-potency to this one-act appear to be of the same type as those existing between being in potency and being in act. These relations can be expressed in the following way: Being-in-potency is to being-in-act as the faculty to see is to him who sees, as the multiple-in-potency (the divisible) is to the one-in-act (indivisible). One can therefore say more briefly: Being-in-potency is to being-in-act as the multiple is to the one.

What difference is there between the relation expressed on the level of being (being-in-potency and being-in-act) and on the level of the one (the multiple-in-power and the one-in-act)?

The relation between being-in-potency and being-in-act is immediate. Surely it could be manifested through the relation existing between the faculty to see and sight, which is better known to us, as well as similar to it, but this manifestation does not modify the intrinsic nature of this *relation* which has only three terms or, if one prefers, two modes or two states of the same reality, namely, *being-in-potency* and *being-in-act* in relation to being. But the relation of the multiple in potency (the divisible) to the one in act supposes another simpler relationship, that of being in potency relative to being in act, on which it is based. Hence, what is here involved is a relationship between two similar relations: the multiple-in-potency is

to the one-in-act as the being-in-potency is to being-in-act. There are four terms instead of two.

Thus here, too, under the aspect of the one and the multiple, the *simple 1·elation of analogy* acquires a new extension. It is transformed into an *analogical proportion* in which the terms connected with one another imply *two similar relations.* To universalize, we could say: Wherever four terms imply two similar relations, there will be an analogy of proportions, for instance, the eye is to the body as the mind is to the spirit. Such relations remain *on the level of properties* or vital functions. They cannot occur on the same level as the primordial structure of being but are based radically (with more or less intermediacy) on that simple relation of being-in-potency to being-in-act. When these relations no longer occur on the level of the vital and essential properties or functions but are exercised in regard to the accidents, one is in the presence of metaphorical analogies. Such analogies can be very useful in artistic or even affective knowledge, but they cannot be part of true philosophical knowledge.

The two great metaphysical analyses of being, then, immediately account for two particular kinds of unity in the midst of diversity, namely, *'TT'por; ev* and *analogy.* The discovery of the property of being accounts for the explications of these two kinds of unity in the midst of diversity. If, in fact, Aristotle reserves the term *analogy* for relation and proportion, he undoubtedly does this with a view to a greater fidelity to the proper sense of *avaAoy[a* (proportion), as well as to a better manifestation of the distinction between the two divisions of being. The division according to substance and accidents gives rise to an order of which the principle is substance, whereas the division according to potency and act gives rise to a simple relation. In the midst of diversity, however, order demands a greater unity than a mere relation. Hence it is normal to qualify these two kinds of unity diversely in the midst of their diversity. What is certain is that being as predicated of substance, quality, or quantity is said neither *univocally* nor *equivocally* but according to a certain order to a principle. Nor is

being as predicated of potency and act said either *univocally* or *equivocally;* rather being pertains primarily to act, secondarily to potency, and hence is according to a certain order (an order which is quite different from the former). It is not surprising, then, if we first examine the logical viewpoint of attribution, if we should speak of analogical attributions with a view to characterizing these intermediary attributions between univocal and equivocal attributions. As soon, however, as we seek to specify the metaphysical foundation of these analogical attributions, we must affirm the irreducible diversity of this basis, as well as of the two divisions of being. Aristotle was especially sensitive to this metaphysical viewpoint, namely, the irreducibility of the two divisions of being.[220] This is why he has reserved the term *analogy* for this ultimate division and for that which follows it, namely, the distinction between the one and the multiple. Nevertheless, we must not forget that, for Aristotle, this ultimate division of *that which is* into potency and act in a certain way presupposes the division of being into substance, quality, quantity. This is why the first basis of analogy is indeed this first division of being possessing the order *7Tp0<; lv* which the second division does not have. Thus it is also normal that they have different names: *7Tp0<; lv* and *avaAoy£a.*

Analogy and the Paths Leading to the Discovery of the First Being

The First Philosophy does not end with that phase of analysis which seeks the proper causes of *that which is;* it implies also an ultimate search. To answer the supreme question: Is there a Being which is the first cause of every existing thing?, it elaborates the paths leading to the discovery of the first Being. These access paths imply various analogical reasonings which make use of the various modalities of the principles of causality. Obviously the First Philosophy of Aristotle

[11] °Commenting on Aristotle's *Metaphysica,* Albert the Great speaks of the *communitas analogiae* relevant to this first division of being (Book IV [r]. Treatise I, Chapter S).

does not explicitly elaborate these diverse analogical reasonings, but these reasonings are in no way opposed to his metaphysical analysis.

Having discovered the necessary existence of the first Being, the First Cause. These judgments of metaphysical wisdom seek between existing realities which we experience and this first Being. In this latter part the First Philosophy does the work of wisdom, it tries to judge every *existing thing* in the light of the First Cause. These judgments of metaphysical wisdom seek to connect the most perfect qualities of men and of various existing realities to their first Source, their Creator, with the recognition that these qualities, to the extent that they are perfect, are said primarily of the Creator and secondarily of creatures. They are achieved in the first Being in a way which is substantial and eminently one, whereas in created realities they are achieved in a participating and limited way. Such judgments are called analogical and imply analogical attributions referring to a " first." This first is no longer substance but the first Being, God.

These analogical attributions indeed presuppose the metaphysical analyses of substance and accidents, potency and act, the one and the multiple, which they achieve on a new level, namely, that of the relations between the first Being and created beings which share in the infinite perfection of the first Cause. In comparison with the analogies examined on the level of the analysis of potency and act and the one and the multiple, these analogical attributions appear extremely complex and synthetic. They are truly ultimate judgments of wisdom manifesting to us the order of participation existing between the perfections of the first Being and those of created beings. These perfections in the first Being are not properties but express its true substance; they are identified with it. On the side of created beings, on the contrary, these perfections express their properties, their qualities and not their substance.

On the level of the First Philosophy, by respecting the terminology of Aristotle, we would thereby have the following:

1.-a first analysis of being which manifests the first diversity of the modalities of being expressed according to *an order towards a first.*

2.-a second analysis of being, which manifests another diversity of the modalities of being expressed according to a relation, *an analogy.*

3.-the distinction between the one and the multiple makes the two preceding distinctions explicit. It puts us in the presence of a new *order* the measure whereof is extrinsic, as well as in the presence of a new *analogy* which implies a similarity of relations, thereby always having at least four terms.

These are the two kinds of ordered diversity, the basis of analogy, and the two elementary kinds of analogy.

The analogical reasonings of the paths leading to the existence of the first Being (which Aristotle does not discuss explicitly) are no longer part of the elementary analyses; they already imply a certain synthetic knowledge. Last of all, in the judgment of wisdom, the analytical attributions also express a certain synthetic knowledge.

Again at the level of analogical discoveries, then, we encounter the various functions of the mind: induction, deduction, judgment. Although apprehension is not specifically mentioned, it is necessarily implied. Moreover, does not Aristotle speak of terms stated manifoldly? Here, too, it seems that analogy is explicit on the level of " relation " and therefore of judgment. On the level of apprehension, he speaks of order, of ordered diversity.

Our mind cannot remain on the level of univocation; inasmuch as it is intellect, it always tries to exceed the limits of univocal knowledge. The appearance of analogy seems, indeed, to be the fruit of a perfect mind achieving this excellence. From this aspect analogy is always a very great risk, since we depart from the stability and the discipline of univocal knowledge, which makes use of predicables, so that we may penetrate into a more pervasive and subtler although less precise knowl-

edge.[221] Does not the principal merit of Aristotle lie m the fact that he grasped this so forcefully?

The Underlying Order of Analogy

This shows us the importance of the notion of order, which is truly the proper basis for the various types of analogical knowledge. There is an *order* between substance and accidental determinations (e. g., quality, quantity, and relation). There is an *order* among these diverse determinations themselves. There is an *order* between potency and act, between first act and second act. There is an *order* between the one and the multiple. There is an *order* between the first Being and created beings.

It is easy to grasp that these orders are very different, each having its proper nature. By specifying their respective principles we can grasp their nature, since each order presupposes a *principle,* which plays the role of *measure* in reference to everything that is ordered.

Between substance and quality or quantity, substance is the principle-measure, a principle according to form. As regards accident substance has an absolute priority according to intelligibility, time and reality. The order which exists between substance on the one hand, and, on the other, quality or quantity, then, is a very determined order, but non-reciprocal, since substance as such is not ordered to quality or quantity.

Among the various accidents, quality, quantity, relation (etc.) , there is a secondary order inasmuch as, in relation with each other, the accidents enjoy a certain priority. Quantity is basic inasmuch as it is the first as subject, as the source of divisibility; it makes reality measurable. Quality is what disposes, what determines, what qualifies. From the aspect of formal specification, it is ultimate, that is, the most perfect. This secondary order has no absolute principle but two relative principles which require each other .

..[1] It would be interesting to specify the way in which analogical knowledge achieves these various " excellences," how, for example, analogical attribution achieves the various types of univocal attribution in an eminent way.

Between potency and act there is a completely different order; the act is principle, term, and end. From the aspect of intelligibility and from the aspect of reality, potency is fully ordered towards act, but from the aspect of time and becoming, potency is first. By this fact, act is a more absolute principle than substance because it is more ultimate and more extreme. It is too absolute to exercise its primacy in the field of becoming, it only exercises this primacy in the field of being. Under this aspect its extension is less than that of substance. The order existing between potency and act, then, is a far more absolute order, since it exceeds simple union and can attain unity. Between potency and act there is achieved a unity of purpose which exceeds the formal order. Within the whole domain of becoming, the order between potency and act is a reciprocal order; hence potency and act are complementary and correlative.

Between first act and second act there is also a reciprocal order, like the order existing among accidents, but this reciprocity goes much further inasmuch as a certain unity of purpose can be achieved between first act and second act. The first act itself is, as it were, assumed by the second act. According to the point of view taken, the principles of this order are twofold. From the aspect of efficient causality, the first act is the principle; from the aspect of final causality, the second act is the principle-term, everything is for its sake.

Between the one and the multiple, there is such an order that the one is the principle-measure. In reference to the multitude this one, principle-measure, has various priorities, accordingly as we consider it as the one-substance or as the one-act, as the one in the domain of quantity, as the one in the domain of time ... or even in the order of being in potency.

Let us specify the various kinds of " one." The *one-substance* possesses all the priorities of substance and makes explicit its role of measure in reference to the multitude of accidents. Substance reduces accidents to unity by ordering them. Between the one-substance and the multiplicity-accidents there is an order like that between substance and acci-

dents. This order is not reciprocal, but for us, and this by reason of the particular mode of our knowledge, the multiplicity-accidents are known first and enable us to reach the one-substance.

The *one-act* has all the priorities of act and makes explicit its role of measure in reference to the multiplicity which is virtually contained in being in potency. The act reduces the virtual multiplicity of potentiality to unity.

Therefore the one as substance or as act measures in two different ways, namely, according to the order of formal causality or according to the order of final causality, in an immanent way or in an ultimate and extrinsic way.

Between the one-act and the virtual multiplicity of potency, there is an order like the order between act and potency. This order is non-reciprocal except when it is a question of becoming. As regards becoming, potency has a priority, not only from the aspect of knowledge but also from the genetic aspect, since all becoming begins with potency and the imperfect. The non-determined, then, is first, it is what imposes itself in the first place. In its way it measures by conditioning the function, whereas the act measures as the end. The one is achieved in a secondary but real way in the various secondary accidental determinations. It maintains a certain unity in the midst of multiplicity and relativity. [222]

[222] In discrete quantity one is the principle of number, there is a numerical order by reason of it. In continuous quantity the point is the principle. As regards surface it is the line; as regards the body, the volume, it is the surface. For qualities, in reference to the *habitus* and perfection, it is wisdom. If we examine the *habitus* from the genetic aspect, the *habitus* of first principles is first in the order of speculative knowledge, but in the order of practical knowledge synderesis is first. According to the order of perfections as regards the " passible-qualities " it is light; as regards the passions it is pleasure; in relation to potency it is the rational potency of efficiency (art); in relation to the figure it is the sphere. According to the genetic order in relation to " passible-qualities " it is the cold; in relation to the passions it is the appetite; in relation to potency it is matter; in relation to the figure it is the triangle. In relationships the one is first of all identity; it is also similarity or equality; and in relation to these relationships there are also, as their foundations: substance, quality, quantity. In movement the one is achieved in continuous circular motion. In time the one is the instant. In place the one is the "celestial sphere," the most ultimate sphere.

As we can see from this simple exposition, this whole philosophical doctrine concerning order plays a major role in the philosophy of Aristotle. It manifests the first transcendence over univocal knowledge. This notion of order occurs again at the end of such a philosophy, at least if we want to unfold all its richness. It is then a question of a non-reciprocal order, the order of the creatures in reference to their Creator, the order of sharing perfection in relation to the perfections of God. This order, which we encounter again in the various judgments of wisdom, is no longer an order underlying analogical knowledge but an order which expresses the full quality and full extension of this knowledge.

M.-D. PHILIPPE, O. P.

University of Fribourg
Fribourg, Switzerland

For *situs* the one is the immobile point ... To these various fulfillments of the one correspond diverse particular orders. The one in being-in-potency is achieved in a secondary way and we are in the presence of what we have called the genetic order. This is found especially in the logical and mathematical and artistic order, where the universal is *unum de multis.*

THE PHILOSOPHICAL DIMENSIONS OF THE ORIGIN OF SPECIES. PART ONE

> " Les philosophes pour lesqucls la du perime est un critere metaphysique, et la pensee a le devoir de vieillir en oubliant, peuvent-ils comprendre que si nous consultons les anciens c'est pour recourir a une fraicheur de regard aujourd'hui perdue? Nulle thesaurisation d'experience, aucun des avantages et aucune des graces du vieillissement de la pensee ne sauraient remplacer la grace propre de sa jeunesse, la virginite de !'observation, !'elan intuiti£ de !'intelligence non fatiguee encore vers la savoureuse nouveaute du reel."
>
> (JACQUES MARITAIN)

PROBABLY it is not possible for educated men not to accept John Dewey's statement that" few words in our language foreshorten intellectual history as much as does the word species." [1] Whether the word "foreshorten" here refers to a near-sightedness of modern scholarship in this area of intellectual history, or to the truth of Dewey's contention that Darwin's work by combining the word origin with the word species " embodied an intellectual revolt and introduced a new intellectual temper," [2] however, is another question which is worthy of consideration.

To this extent, Dewey's contention is certainly true and accurate: in the whole matter of evolution, the mass of data which scientific research has uncovered and attested has had a cumulative effect in making an ancient and traditional problem about the nature of species a currently insistent one, and

[1] John Dewey, "The Influence of Darwinism on Philosophy," in *The Influence of Darwin on Philosophy* (New York: Holt, 1910), p. 3.

[2] *Ibid.*, p. 1.

STRUCTURAL OUTLINE

I. The State of the Question. II. Approach to the Problem. III. The Logic of Evolutionary Science. V. Specific Structures in an Evolving World. VI. The Error of Univocally Ontologi2ed Kind-Essences. VII. The Operational Displacement of Typological Thought in its Implications for Hierarchy. VIII. The Two Hierarchies. IX. Conclusion.

one which, in the contemporary mind, serves to exemplify in a clear and striking manner the incompatibility of modern science and traditional philosophy.

I. THE STATE OF THE QUESTION

Whether there is an incompatibility between modern science and traditional philosophy is an interesting question, and one which admits of no single, simple answer; but the evolution of species may not be an illustration thereof, and it is certainly not a clear and striking illustration; for it is not entirely accurate to oppose the modern conception of species to the conception entertained by the ancients, particularly Aristotle, and to claim on this basis (as so many do) that the entire classical metaphysical approach to the essential structures of existence has been shown to be a cultural illusion.

As a matter of fact, the intention guiding the theoretical efforts of the ancients was simply different from that which preoccupies the evolutionary biologists. The ancients dealt with the problem of species primarily in terms of knowledge, by reference to the question of whether the mind can lay hold in concepts of the necessities truly governing the ontological structure of the world; and in judgments, of the existence exercised by things independently of those conceptions which we form. By contrast, modern biology has approached the problem of species simply in terms of their reality in the nature of things, especially in the community of living things, and only secondarily has it given thought to the epistemological value of specific concepts.

It is true, of course, that the ancients did regard the specific structures of extramental realities as fixed once and for all, and this on the basis both of inadequate observational data and cultural assumptions. But the question of species as addressed by modern biology was only placed rather late in Western history, beginning with the work of John Ray, Carolus Linnaeus, and Comte de Buffon, in the seventeenth and eighteenth centuries.

This point may be illustrated textually, and its capital im-

portance indeed makes such illustration incumbent on us. First of all, with respect to the species problematic of traditionaJ philosophy so far as it traces its roots to Aristotle, Mortimer J. Adler, whose reputation as an authority on the Western intellectual tradition is well known, has made a comprehensive analytical survey of all the texts in Aristotle and St. Thomas dealing with the problem of species, and has formulated this judgment: "the word 'species,' as used in the philosophy of nature, never refers to an existent thing .... " [3] " The notion of species is strictly a logical concept; . . . any use of the word ' species ' to signify anything other than the concept *species* itself, is a derivative mode of signification. Strictly speaking, the concept *species* is never used ontologically; the word ' species ' can be .... " [4]

Philosophically, and still speaking within the explicitly Aristotelian tradition of natural philosophy, Jacques Maritain concurs in this assessment: " the notion of species is *in itself* a logical notion, concerning the mode of existence of things in our mind, or insofar as they are known *(intentiones secundae).* This notion, logical in itself, can be employed either from the logical or the ontological point of view." [5] But even "the ' species ontologically considered ' is not exactly the ' specific nature,' but rather an application of the logical notion of species ... "; [6] so that, even in the case of species understood in the ontological sense, for a traditional natural philosophy transparent to itself, "species remains still a logical entity, but this second intention is then related to the ontological order of essences or of *primae intentiones."* [7]

In the second place, with respect to the species problematic of evolutionary biology, Ernst Mayr, in what Julian Huxley has

• Mortimer J. Adler, *The Problem of Species* (New York: Sheed and Ward, 1940), p. 14. The reader is asked to refer immediately to my wmments on this work in fn. below, second paragraph.

• Mortimer J. Adler, "The Solution of the Problem of Species," *The Thomist,* III (April, 1941), p. fn.

• Jacques Maritain, "Foreword " to Adler's *The Problem of Species,* p. ix.

[6] Jacques Maritain, " Concerning a 'Critical Review'," *The Thomist,* ill (January, 1941), fn. p. 46.

[7] *Ibid.,* p. 47, fn. 4.

called " a masterly and illuminating statement of contemporary thinking about species and their basic role as integrated units of evolution," expresses the scientific concern for the metalogical reality of species by pointing out that a typological species-concept based on essential properties common to individuals of the type is impossible to employ if one seeks directly to encompass the multidimensional dynamics of reproductive populations *as* ecological units; while on the other hand, " internal cohesion of the gene pool " within such populations and " the biological causation of the discontinuities " between such populations provides an intelligible ensemble of interaction resulting in a properly biological species-concept devoid at once of both the arbitrary and the purely noetic type or " essential kind." [8] "Whoever, like Darwin, denies that species are nonarbitrarily defined units of nature not only evades the issue but fails to find and solve some of the most interesting problems of biology." [9] For contemporary evolutionary science, the ecological population clusters and the discontinuities observed between them " are not, as sometimes contended, abstractions or inventions of the classifier." [10] "It must be stressed that this discontinuity exists whether it is or is not used by the systematists for their purposes, and for that matter whether it is studied at all." [11]

In organisms which reproduce sexually and by crossfertilization, the reality of species as biological units can also be demonstrated by a quite different method. . . . These communities consist of individuals united by the bonds of sexual unions, *as well as* of common descent and common parenthood .... A species is, consequently, not merely a group and a category of classification. It is also a supraindividual biological entity, which, in principle, can be arrived at regardless of the possession of common morphological characteristics.12

[8] Ernst Mayr, *Animal Species and Evolution* (Cambridge, Mass.: Harvard, 1968)' p. 21.

• *Ibid.,* p. 29.

[10] Theodosius Dobzhansky, *Genetics and the Origin of Species* (Srd rev. ed.; New York: Columbia, 1951), p. *5.*

[11] *Ibid.,* p. *255.*

[12] *Ibid.,* p. 6, emphasis added.

These texts make it clear, I think, that John Dewey's simple opposition of traditional philosophy and modern science as knowledges of nature mutually incompatible by reason of their respective conceptions of species was premature, although certainly justified in the light of Darwin's original opinion and long-sustained view:

> I look at the term species as one arbitrarily given, for the sake of convenience, to a set of individuals closely resembling each other, and ... it does not essentially differ from the term variety, which is given to less distinct and more fluctuating forms. The term variety, again, in comparison with mere individual differences, is also applied arbitrarily, for convenience sake.[13]

So long as evolutionary science maintained that species were conveniences pure and simple, arbitrarily chosen points in the continuum of nature rather than natural articulations thereof, the species problematic did provide a clear and striking illustration of a radical incompatibility between traditional philosophy and modern science. In traditional terms, Darwin's position was that specific distinctions are entirely *quoad nos*, and not at all *secundum se*. Such a position could not in any sense coexist with the first principles of traditional philosophy.

> To accept this view [of Darwin's] is to deny the doctrine of substantial forms; for, according to it, all things would differ only accidentally. If we are to maintain a hylomorphic conception of nature, we must preserve the integrity of substantial forms, both *secundum se* and *quoad nos*.[14]

The traditional notion of species, logical in itself (" typological," in Mayr's terms [15]), could, if employed from an onto-

[13] Charles Darwin, *The Origin of Species* (New York: Modem Library Giant n. d.), p. 46. (Original publication date was 1859).

[14] Adler, *The Problem of Species*, p.

[15] Actually, this correspondence is not quite precise. For Mayr, "typological thought " is thinking in terms of reified ideal types. On the other hand, when Maritain speaks of" the order of typological discrimination" (e. g., see *The Degrees of Knowledge*, 1959 English ed., p. 177), he is speaking of the order of intelligible necessities discriminable at the heart of natural existents. At the same time, since, as we shall see below, esp. in Sec. VI, Maritain's doctrine on the nature and number of species does seem to include a large element of unwarranted reification

logical point of view, be used to designate specific natures as the fundament in things which mediates the universal intention of pure intellection as an index in some respect *(which* respect, however, it is for ontology and never logic to determine [16]) of

of epistemological constructs, the correspondence is not entirely imprecise either. See fns. 16 and 22 *infra,* and the references there cited. In itself, however, the word " typology " as employed by the two authors is as diverse as the two species problematics we are here limning.

[10] See Adler, "Solution of the Problem of Species," pp. 302-3: "We are concerned with the problem of the ontological vs. the logical, as that occurs in epistemology. I am here thinking of the problem of how these two spheres of knowledge are ordered to one another. The oft-cited fact that the science of logic considers, *in its own way,* everything which falls within the scope of all other bodies of knowledge (i.e., all knowledge of the real-vd. Aristotle, *Metaphysics,* IV, 2, 1004bl7-26, and St. Thomas, *In IV Met.,* lect. IV, n. 574), does not solve this problem. Although the spheres of logic and of ontology (in the broadest sense) are co-extensive, the two kinds of science are not simultaneous: each in its own way has a certain priority over the other. Thus, *in the order of analysis, the logician has priority* with regard to the notion of *species,* for *species* is exclusively a second intention; and when the philosopher of nature or the natural scientist uses this notion, he borrows it from the logician. This is seen in the fact that any employment of the word " species " or the word" specific" in the first intention is a derivative usage. (The concept species is a second intention even when it lends its significance to the word " species " as used in the first intention to designate a specific nature; and even when it enters, as a second intentional note, into the signification of a concept, such as man, which is primarily a first intention.) But, *in the order of learning and discovery,* first intentions are prior to second intentions, and here *the student of nature, philosopher or scientist, takes priority.* Nature itself is prior to knowledge of nature, and knowledge of nature, in turn, is prior to knowledge of knowledge. If there were not *in fact* substances differing specifically (i.e., diverse in specific nature), we could not *in truth* form concepts of these natures, which contained the intention of specificity, and hence we could never have derived the concept *species* itself. This fact about priority is extremely important to the philosophy of nature. Although he must listen to the logician with regard to *species* and *genus,* the philosopher of nature speaks first when it comes to saying how many specific natures there are, how they share generic natures, how they are ordered, etc. There need be no conflict between logic and ontology in the consideration of these problems, in which they both have an interest; but there will be conflict, with consequent confusions and errors, unless the two spheres of knowledge are well-ordered to one another. Thus, it is not for the logician alone to say whether the concept *man* is truly a specific concept; he can say what the formal properties of any concept must be in order for it to be *a species* or *a genus;* but the interpretation of the facts of nature in the light of strictly ontological principles is indispensable for the final determination whether this or that concept is *a species* or *a genus.* Logicians, or readers of logic, who fail to realize this fall into grave error, the sort of error which can become an obstacle to truth in the philosophy of nature, in so far as

all or none: such usage, however, is always derivative and secondary; for in the domain of material beings species as such cannot exist, and even the specific nature for philosophy " is not an ens, but an *ens entis."* [17] Moreover, since (1) the logical species concept, employed from an ontological point of view and in the perspective of reasons for being, intelligibly considered refers exclusively to natural entities which differ radically in kind, i. e., to things in which an observable or manifest difference in kind is based on and explained by the fact that one of the two beings being compared has a factor or element in its fundamental constitution or make-up that is totally absent from the constitution of the other-in other words, to natural kinds recognizable as different not simply in the order of existence exercised, but in their metaphysical composition in the pure line of essence taken in itself; since, in addition (2) beings which differ in this way differ in essential grade by a whole step (since, logically, essential differentiation involves positive and negative differences rooted in the same perfection, so that there can never be more than two essential species in a single genus; or, more exactly, since such differentiation involves " two, not three, distinct perfections, of which one radical kind possesses both and is, therefore, the higher, and the other possesses only one and is, therefore, the lower " [18]), while yet remaining, as forms educible from matter, not sufficiently determined in their intelligible note to exist except under

the student of nature must employ the logical concepts of species and genus. But falsity in the philosophy of nature can also cause errors in logic; if the logician is misled by the naturalist to make wrong discriminations among concepts (e. g., between those which are and those which are not properly specific), he may develop a false or confused analysis of *species* and *genus.* In fact, both of these mistakes have actually happened in the history of *phuosophia perennis:* falsity in the philosophy of nature has caused errors in logic, and errors in logic have been an obstacle to reaching the truth about nature." See *ibid.,* fn. 87 p. 847; and in this present essay fn. *infra.* and Sects. VI and VIII esp.; also *The Problem of Species,* Chs. II and III, pp. esp. Ch. III, " Our Knowledge of Species," pp. where the alternative positions are set out and their implications clearly indicated. See also pp. x, xii, 48, 47, 94 fn. 180, And fn. *infra.*

[11] Adler, *The Problem of Species,* p. 14.

[18] Mortimer J. Adler, "The Hierarchy of Essences," *The Review of Metaphysics,* VI (September, p. 17. This point will be developed in Sec. VIII *infra.*

the supraessential determinations inseparably involved at the very level of first act inasmuch as they are constituted by the accidents caused by or the simple variegated determinateness of the signate matter involved in generation [19] (so that "it is the absence of complete determination, and the incapacities for self-individuation which call for matter ... which are the last cause of the essential complexity of *entia mobilia* " [20]) ; by reason of these two conditions, the real existence of natural beings radically distinct from the standpoint of constitutive intelligible notes has always depended in traditional philosophy on an inductive procedure viewed, exactly as in modern science, " as a process of concluding from instances or particular evidences that a nominal definition is real or, in other words, that the kind for which a definition can be notionally or verbally formulated really exists." [21]

Considering for the moment only the case of the two essential kinds that divide a single genus, the inductive procedure by which the formulated definitions can be established must involve instances that differentiate one species from another. To do this, the instances must provide evidence of a hierarchical relation between the traits or perfections possessed by one sub-class of things and those possessed by another, the two groups being accepted as belonging to the same generic class. In short, in the realm of essential kinds, the specifying signs must also hierarchize or be signs of hierarchy. [22]

[19] See Adler, *The ProblMn of* pp. 188-195, esp. pp. 193-4.

[20] Charles De Koninck, *Le Probleme de l'lndeterminisme* (Quebec, 1937; Extrait des rapports de ia Sixieme Session [1935), de L'Academie Canadienne Saint-Thomas d'Aquin), p.

[21] Adler, " The Hierarchy of Essences," p.

[22] *Ibid.,* p. This point is extremely important, and an inescapable consequence of essential constitution through genus and difference. In fact, it is probably not too extreme to say that only someone unfamiliar with the available literature or who has not grasped the main implications of the metaphysics of essential composition could call it into question. Thus Adler could write that, from a traditional point of view, " it be that the principle of perfect hierachy is self-evidently true-immediately known by anyone who fully understands the notion of species itself." (" Solution of the Problem of Species," p. see also pp. 307 ff., 337 fn. 338 fn. 73, 338 fn. 73a, 347 fn. 87.) We will return to this point of the necessity for strictly essential kinds to be ordered in a unilinear hierarchy when discussing in Section VITI below the modes of difference. Here we may

Since, so far as the species problematic of traditional philosophy is concerned, everything depends on the notion of hierarchy bound up with the metaphysical constitution and consequent ordering of specific natures in their purely intelligible line, we may point out explicitly that it involves four principal notes: [23]

I. an absolutely unilinear ordering in which each radical kind (" infima species ") is higher or lower than another, and no two are coordinate;

Q. a discontinuous ordering in which proximate radical kinds are separated by a unit difference, so that there is no medium between them;

note that Adler's point. also follows from the fact that the human species is the *causa cognoscendi (non autem essendi)* of the whole hierarchy of essences. See Charles de Koninck, " Reflexions sur le probleme de l'indeterminisme," *Revue Thomiste,* XLIII (1937), p. 235: "Il n'y a point intermediaire entre · etre ', 'vivre ', 'connaitre' et 'intelliger '. Le caractere absolu de cette gradation trouve d'ailleurs son fondement dans !'idee de l'homme dont !'arne est formellement sensitive, vegetative et forme de corporeite. Parce que !'arne de l'homme est tout cela, non seulement eminemment mais formellement, ces degres d'etre sont susceptible d'etre distinctement realises hors de lui." As Adler has so thoroughly pointed out, "the point here being made is extremely important. It has traditionally been supposed that there are essential perfections which we do not know, and hence that we are justified in employing accidental perfections in the differentiation of species, i.e., by using properties or even contingent accidents as signs of substantial differences *even when we do not know what these substantial differences might be.* But this supposition is absolutely invalid on the ground that human nature virtually includes all inferior natures and actually possesses the essential perfections of all inferior things *eminenter.* Since we claim to know the structure of human nature *adequately,* we cannot consistently say that there are inferior species whose substantial perfections are rooted in essential perfections *not known* to ns. Hence we are entitled to employ proper or contingent accidents as signs of substantial [i. e., essential] differences only with regard to those which are rooted in *known* essential perfections-known through our knowledge of man. *In fact there are no others."* (" Solution of the Problem of Species," fn. 73a p. 338. Cf. *The Problem of Species,* pp. 109-111; and fn. 16 *supra.* Some interesting external qualifications are placed on this line of argument in his later study "The Hierarchy of Essences," fn. 11 p. £0, pp. £8-9, fn. £0 p. 29.) A main point of this present article will be to point out that strict adherence to the principle of parsimony in our account of essential kinds imposes this same conclusion quite apart from Adler's reasonings-see esp. Sec. VI below.

[23] Cf. *The Problem of Species,* pp. 109-10.

8. the distinction of radical kinds by the presence or absence of properties which signify through interaction the unit differences, and not by the possession of the same property in different degrees;

4. the virtual inclusion by a radical kind (specific nature) of all lower radical kinds, so that a given radical kind will have all the *strict* properties belonging to inferior radical kinds, in addition to which it will have the distinctive property that constitutes its superiority.

Turning now to the contemporary species problematic, let us set up as well as we can a parallel contrast.

The biological notion of species, metalogical in itself (concrete as well as nonarbitrary, in Mayr's terms), could, if employed from an epistemological point of view, be used to indicate specific natures as taxonomic categories (taxa) which mediate the population structures of interacting individuals as indices in some respects *(which* respects, however, it is for genetics and never taxonomy to determine) of specific discontinuity: such usage, however, is always derivative and secondary, for" the evidence is usually morphological, but to conclude that one therefore is using or should use a morphological concept of the category (not taxon) species [i.e., of the specific population as well as of the taxonomic class] is either a confusion in thought or an unjustified relapse into typology." [24] Moreover, (I) since the metalogical species concept is itself a collective concept englobing the multidimensional dynamics of population behavior, what the taxonomist must seize on as a specifying " property " is never a unit formal difference but an aggregate of morphological characters which taken together are distinctive. In doing so, because he employs a concept which is in itself indifferent to the pure line of intelligibility and bears consequently no immediate reference to the possible distinction

•• George Gaylord Simpson, *Principles of Animal Taxonomy* (New York: Columbia, 1961), p. 150. See Mayr's comments in *Animal Species and Evolution,* pp. !l7-9, on the problem of classifying a-sexual organisms, where " arbitrariness and subjectivity cannot be avoided." (Further references in fn. 151 below.)

of substantial from accidental beings (both separable and inseparable), and of these from property (as necessary accident), he is concerned with evidence for the distinction of natural kinds, as Simpson points out, only so far as it is susceptible of judgment " in the light of known consequences of the genetical situation," i.e., the situation of generation, " stated in the definition [of the ecological population]." [25] This amounts to saying that the metalogical species concept employed from a logical (taxonomic) point of view and in the perspective of reasons for being biologically considered (as resulting in discontinuities between populations) refers to natural entities which differ in kind without being concerned to further discriminate whether that difference in kind is only *apparent* [26] or *real,* either *radical* (as defined above), or *81tperficial.* By way of contrast, then, just as the traditional species problematic was centered on the discrimination of natural kinds which were such both in the order of existence exercised and in the pure line of essence considered in itself, so the evolutionary species

[25] *Ibid.*

[26] The terms here introduced must be defined at least nominally and as they will be used throughout this essay. In Section VIII, these definitions will be correlated with and justified in terms of the possible modes of difference. At that point we will also justify our equation of " radical kind " with the traditional notion of "essential kind," and *per consequens* of "accidental kinds" in the traditional sense with both apparent and superficial differences in kind. The definitions are as follows. (1) *Apparent difference in kind:* When, between two things being compared, the difference in degree in a certain respect is large, and when, in addition, in that same respect, the intermediate degrees which are always possible are in fact absent or missing (i. e., not realized by actual specimens), then the large gap in the series of degrees may confer upon the two things being compared the appearance of a difference in kind; really they differ in degree and not in kind. (!'.!) *Superficial difference in kind:* An observable or manifest difference in kind may be based on and explained by an underlying difference in degree, in which one degree is above and the other below a critical threshold in a continuum of degrees. (3) *Radical difference in kind:* An observable or manifest difference in kind may be based on and explained by the fact that one of the two things being compared has a factor or element in its constitution that is totally absent from the constitution of the other; in consequence of which the two things, with respect to their fundamental constitution or make-up, can also be said to differ in kind.

These preliminary definitions are taken from M. J. Adler's analysis of the modes of difference in *The Difference of Man and the Difference It Makes* (New York: Holt, 1967), pp. 15, 19-35, and *60-65,* esp. pp. *28-5.*

problematic is centered on the discrimination of natural kinds which are such in the order of existence exercised, without regard for the pure line of essence taken in itself. Additionally (2) speaking in the traditional language, and still for purposes of contrast, natural kinds of the first sort would have to be referred to as " essential natural kinds " and constitute an exclusive category; natural kinds of the second sort, indifferently apparent or real in either sense, would have to be referred to as " accidental natural kinds " and constitute an inclusive category.

Thus the real existence of natural kinds depends, for evolutionary science as for traditional philosophy, on induction "so far as it is a process of inferring from observable particulars generalizations about the articulations of nature"; but now it is a question of beings really distinct only from the standpoint of relatively constant and peculiar attributes which when taken as an aggregate " typify " an ecological unit by reference to the genetical situation of its individual members.

So far as accidental natural kinds are concerned ... the inductive principle is derived from the character of accidental differentiation and definition. Since differentiation [of this sort] involves positive differences rooted in contrary perfections [i. e., any distinct respect in which the being of a thing or the understanding of it can be completed or made more determinate], and since each of these positive differences is conjoined with a generic term signifying a distinct perfection, the evidence for an accidental natural kind would consist, in the simplest case, of instances which show a constant conjunction of two traits, combined with instances in which the contrary of one of these traits is conjoined with the trait that appears to be generic. . . . In their taxonomic inquiries, the empirical sciences deal, for the most part, with more complex cases in which the accidental definition, to be tested or established inductively, consists not of one generic term and one positive difference, but of a genus combined with a number of positive differences which are supposed to signify inseparable traits. The problem is not whether the trait signified by the genus is always accompanied by the traits signified by the set of differences, but whether when it is accompanied by one of them, it is also accompanied by the others that are proposed by the definition as being co-present ... the accidental definition in question asserts that in

a certain natural class of things there is a natural sub-class constituted by a number of inseparable traits. . . . Furthermore, since each sub-class is determined by positive differences each signifying the possession of a distinct trait, there need not be *only two* subclasses within a given class. In the accidental order, a genus can have more than two species, the differentiating traits of each being *as a set* contrary to the sets of differentiating traits in all the others. [27]

We may complete our parallel contrast here by pointing out what notion of hierarchy is necessarily bound up with the existential constitution and consequent ordering of individuals as genetic members of ecological populations. Because the logical species concept employed derivatively from an ontological point of view regards only things radically different in kind, it orders species according to what are properties with a strictly ontological status in the metaphysical composition of essences. Since properties in this sense are convertible with the formal perfection which establishes a radical kind in and as its grade of being, and grades of being differ as higher and lower by a unit difference, the species of the traditional problematic (however many or few) constitute an order of species which is necessarily a *unilinear* hierarchy, "a perfect hierarchy of specific natures, in which each member is, in essential grade of being, higher or lower than a proximate inferior or superior, and in which no two specific natures are of coordinate grade in any respect except that in which all corporeal substances are of the same grade, namely, as corporeal (i.e., as falling within the same *natural genus*, signified by the presence of prime matter in their substantial composition)." [28] (At the same time, it must be noted that these levels or grades of being existentially considered had no absolute limits but defined probability zones for statistical variations [29]).

By contrast, because the metalogical or biological species concept employed derivatively from a taxonomic point of view regards whatever things factually differ in kind in any one or

[27] Adler, "The Hierarchy of Essences," pp. 27-8.

[28] Adler, " Solution of the Problem of Species," pp. 285-6.

[29] De Koninck, *Le Probleme de l'lndeterminillme*, p. 126. Cited in Adler, *The Problem of Species*, pp. 80-82.

combination of the three possible modes of difference, it orders species according to whatever characteristics in the aggregate are revealed as proper to a population in the light of what is known of its genetical situation. When the groups so ordered are arranged in a taxonomic hierarchy, the generic levels interrupt the specific orderings no matter how these are set up among themselves; and against the generic background of the taxonomic hierarchy, moreover, the specific or natural groupings may be variously ordered but never in such a manner that that the natural kinds are each one higher or lower than some one other, which is its proximate inferior or superior. Thus the taxonomic hierarchy of evolutionary science, derivatively based on the metalogical species concept, involves, like the ontological hierarchy of traditional philosophy, derivatively based on the logical species concept, four principal notes, contrasting almost point by point with the principal notes of the perfect hierarchy:

> 1. in some cases the natural kinds are related coordinately in a genus, as contraries are: this is consequent on the fact that their specifying properties are related as contraries;
>
> in some cases, the natural kinds are related as higher *or* lower than one another, but in a scale of continuous degrees of the same difference: this is consequent on the fact that two natural kinds may have the same specifying properties but in different degrees;
>
> 3. in some cases, the species are ambivalently related as higher *and* lower than one another in different respects: this is consequent on the fact that each of two natural kinds may possess and lack specifying properties respectively lacked and possessed by the other;
>
> 4. ambivalently related species may also be coordinate in other respects without contrariety: this is consequent on the fact that they may also possess certain characteristic in common, while differing in others. [30]

[8°] Cf. Adler, *The Problem of Species,* pp. cause of these four types of ordering,-contrariety, "It should be noted that the continuity, multilinearity and

If, then, one contrasts the two species problematics in terms of hierarchy alone, their different preoccupations leading to different results emerge rather clearly:

If manifold differentiae are employed, instead of single differentia, two items may each be superior and inferior to the other in different respects. If one tries to order a set of items, which are distinguished *inter se* by manifold differentiae, no single arrangement of them is possible. There will be several ways of ordering them as lower and higher in being, according to the particular characteristics chosen. I call this the fact of multilinear, in contrast to unilinear, ordering. A hierarchy is imperfect if it is subject to generic interruptions and multilinearity, [and] a hierarchy of accidental terms is necessarily imperfect in both these respects.[31]

Thus modern evolutionary science differs from Darwin, on the one hand, by affirming the reality of species as non-arbitrary articulations of nature; but it differs, on the other

coordination, all of which are incompatible with [perfect] hierarchy,-is the same in each case. But that there are four types of ordering here,-in contradistinction to the unity of hierarchical ordering,-is due to the fact that the specifying ' property ' is never a unit, but an ' aggregate of properties.' Though the properties of any one species are a constant aggregate, inseparable from that kind of substance, the members of a given aggregate are not all related to the members of an aggregate specifying another substance in the same way. Because of the fourfold diversity of relationships among the members of such aggregates, there is a fourfold ordering of substantial species. These four types of ordering are not exclusive of one another; nor are they necessarily combined. In different respects, two species may be related in all four ways; or only in one, or two, or three.

" Furthermore, this fourfold ordering of species does not mean that one group of species may not be hierarchically related to another group, for it is not inconsistent if their genera constitute a hierarchy. Thus, for instance, all plants, generically, as plants, may be hierarchically inferior to all animals, considered generically; and this may be true even for subordinate genera of plants or animals, although as a matter of fact the latter truth may be more difficult to evidence. But that is not the point here being affirmed. It is rather that, within any proximate genus, the species, considered as species of that genus, are susceptible to a fourfold ordering, and are not hierarchically disposed."

[31] Adler, "Solution of the Problem of Species," fn. *57* pp. 323-4. For the reasons why a hierarchy of accidental terms-superficial and merely apparent kinds-is necessarily imperfect in both these respects, see *ibid.,* fn. 122 p. 367; also *The Difference of Man and the Difference It Makes,* p. *57;* and A. 0. Lovejoy, *The Great Chain of Being* (Cambridge, Mass.: Harvard, 1948), pp. 253-4, ii!69-70, 275-7.

hand, from Aristotle as well, by denying the possibility of an all or none aspect of specific differentiation.

The reconciliation between Darwinian evolutionary science and Aristotelian philosophy, for reasons we have seen, was a hopeless and impossible task. Their incompatibility, as Dewey suggested, was direct and absolute. Between post-Darwinian biology (contemporary evolutionary science) and Aristotelian philosophy, however, there lies a difference of primary and secondary contexts, or if you like, an inversion of primary and secondary questions.

From this it is clear that if the evolution of species ascertained by modern science does indeed illustrate a fundamental incompatibility between that science and traditional philosophy, it does not do so in the direct and straightforward manner that it seemed to do when Dewey assessed " the influence of Darwinism" in the first half of our century. It is certainly naive of any contemporary writer assessing the concept of evolution in philosophy to flatly affirm, as Oliver Reiser does, that " Dewey is certainly correct in his analysis, in his early essay (1910) on ' The Influence of Darwin on Philosophy.' " [32]

It may be, of course, when the complex differences we have outlined separating the primary concern of traditional natural philosophy and of modern natural science with respect to species are all accounted for and seen in the light of their mutual ramifications, that a fundamental incompatibility-a mutual negation, in effect-may stand out. That is the question which will occupy the rest of our analysis.

II. APPROACH TO THE PROBLEM

The problem we have set ourselves seems to me to involve several distinct facets or phases of analysis, related to each other in such a way that each arises in terms of the previous one. First of all (Sec. III), it is necessary to come to terms with

•• Oliver L. Reiser, "The Concept of Evolution in Philosophy," in *A Book That Shook the World, Anniversary Essays on Charles Darwin's "Origin of Species,"* Ralph Buchsbaum, ed. (Pittsburgh: University of Pittsburgh Press, 1958), p. 38.

Dewey's contention that the logic immanent to traditional philosophy and the order of questioning which it imposes are together "outlawed, flanked, dismissed-what you will"[88] by the "genetic and experimental logic"[84] immanent to "the Darwinian mode of thinking."[35] Is the bearing of "Darwinian ideas," of species as products of processes, upon philosophy such that it "dismisses one type of problems and substitutes for it another type?"[36] Is this what is implied in our sketch of the inverted concerns of traditional philosophy and modern science with respect to species?

If our answer to this question is affirmative, then our central problem of whether the evolution of species illustrates a fundamental incompatibility between traditional philosophy and modern science will be settled, and we may get on with the task of radical "reconstruction in philosophy." If our answer is negative, then before any attempt to mediate between the differently posed species problematics of traditional philosophy and modern science, it will be necessary to state clearly the theoretical framework which underpins the modern species concept and problematic, and to show how this framework incarnates in its own way the logic of rational understanding formally delineated in the preceding stage (Sec. IV).

We will then be in a position to state the contemporary species problem in its own terms (Sec. V), preparatory to an attempt to take up the implications of the reality of specific structures as modern biology delineates them, in order to see whether it is in fact a reality too dark for the illuminative power of the essential principles of the metaphysics and natural philosophy of the scholastic tradition (Sec. VI). Rather than contrast the results worked out within two altogether differently specified problematics, such as the ancient and modern species problematics are, in order to judge earlier conclusions on the basis of principles heterogeneous to those conclusions, it

[88] John Dewey, "The Influence of Darwinism on Philosophy," p. 18.
[84] *Ibid.*, p. 18.
[35] *Ibid.*
[36] *Ibid.*, p. 18.

would seem more useful (and more genuinely philosophical), in short, to work the other way round and see if the *fundamental categories* of traditional ontology, rather than particular conclusions, can be shown to be adequate to the implications of the modern way of stating the issues. Only then will we be in a fair position to adjudicate whether or not the data of evolution are thinkable only by some kind of process philosophy which abandons hope of any transcendent or metaphysical perspective in the traditional sense of the term.

This will be the most difficult phase of the analytic. In order to carry it through, we shall have to essay a hylomorphic analysis of the structure of interaction in terms of what can be said at the level of existence exercised prior to any analysis of the pure line of essence taken in itself-that is, without first answering definitely questions about the constitution, order, and number of radically distinct natural kinds. Novel and difficult as such a task must prove, there is no other way to mediate between the contemporary and traditional species problematics other than by a concrete proof that both can be stated analogically within the traditional categories of philosophy. By transposing the traditional question of essence onto the level of the structured exercise of existence, moreover, we may expect to gain a fresh angle on the traditional problem of *subsistentia.* The reason for this should be clear:

> If the word " essence " be used to signify what is the proximate subject of the act of existence, then, in the case of composite substances, essence as the subject of existence must be the individual nature rather than the specific nature. In other words, in the case of composite substances, essence as the quiddity or principle of intelligibility, and essence as the proximate subject of existence, are not the same nature ... ,[37]

We should also find ourselves, thanks to this same transposition, in a position to show that the projected disproportion supposedly involved in the causal succession of " higher " from "lower" forms is a one-sided and misleading problematic, a

[87] Adler, *The Problem of Species,* p. 18, text and fn. 6.

caricature in fact of the Aristotelian- Thomistic understanding of the reciprocal activation of causes. The actual coming to terms with this " higher from lower " causality problematic, however, will have to be delayed in our analytic until we reach the point where the modern species problematic re-engages through its secondary implications the central concern of the traditional problematic (Sec. VIII) .

To this end it will be appropriate to consider the contribution of mathematics to the contemporary formulation of the species problem (Sec. VII) , showing how the effective assessment of the workings of natural selection entails an arrangement of natural kinds in an overall hierarchy, and does so *ineluctably;* from here it is an easy transition to the traditional problematic of radical natural kinds, and thus, from the very heart of the modern species problem by a line of continuous analysis, we shall arrive at the problem of the two hierarchies, the point where the traditional preoccupations become meaningful against the backdrop of modern preoccupations (Sec. VIII).

We will then be in a position finally to answer our guiding question as to whether the evolution of species illustrates any alleged incompatibility between modern science and traditional philosophy (Sec. IX) .

III. THE LoGIC OF RATIONAL UNDERSTANDING

It is both startling and interesting to find Dewey point out, on the one hand, that in seeking a logic of science " there are but two alternative courses: we must either find the appropriate objects and organs of knowledge in the mutual interactions of changing things; or else, to escape the infection of change, we *must* seek them in some transcendent or supernal region ";[38] and then, on the other hand, to single out Aristotle and the scholastics who followed him as the prime example of men following the latter course.

As a matter of the scholarship proper to philosophical

[88] John Dewey, *art.* cit., pp. 6-7, Dewey's own emphasis.

history, it is not difficult to show that such a view entirely misses the doctrinal differences between the Platonic and Aristotelian explanatory modes.[39]

But-what is more fundamental-it is necessary to say that such a view betrays a misunderstanding of the Aristotelian *Organon* that is almost total. What Aristotle essayed was in fact a delineation of the necessary steps involved in the securing of a rational understanding in the mutual interactions of the beings of nature. And ever since Aristotle, " the scientific study of natural objects has always followed the procedures of methodological behaviorism for the simple reason that no other procedures are possible "-except in myth-making-though "the word' behaviorism' itself is new and dates from the time when students of man decided to forsake introspective methods." [40]

What Adler is here referring to as" methodological behaviorism " is Aristotle's doctrine of *scientia* (rational understanding, be it scientific or philosophical) as reasoned facts, a doctrine articulated in terms of the four scientific questions and the four causes.[41]

Since our concern here is with the logic of rational knowledge of nature simply for the purpose of demonstrating that there is

[39] See the essay "Evolution as World-View and as Philosophy," esp. Section II, A-H, in *The Problem of Evolution: A Study of the Philosophical Repercussions of Evolutionary Science,* by Raymond J. Nogar and John N. Deely (New York: Appleton-Century-Crofts, 1970). Also R. J. Nogar, *The Wisdom of Evolution* (New York: Doubleday, 1963), pp. 315-6. See also Richard McKeon, "Aristotle's Conception of the Development and the Nature of Scientific Method," *Journal of the History of Ideas,* VIII (January, 1947), pp. 3-44. We will return to this point in the present essay at fn. 85 below.

•• Adler, *The Difference of Man,* p. 150.

[41] See Aristotle's *Analytica Posteriora,* esp. Bk. I, ch. 13, "The difference between knowledge of the fact and knowledge of the reasoned fact"; Bk. II, ch. 1, "The four possible forms of inquiry," and ch. II, " The several causes as middle term." A brilliant exposition of the phases of investigation required for rational understanding is Benedict Ashley's "Does Natural Science Attain Nature or Only the Phenomena," in *The Philosophy of Physics,* V. E. Smith, ed. (New York: St. John's University Press, 1961), pp. 63-8!'Z. Further exemplification may be found in William A. Wallace, "Some Demonstrations in the Science of Nature," *The Thomist Reader,* 1957, pp. 90-118.

no "new logic " implied by evolutionary thinking distinct from and opposed to the traditional philosophical logic, it will suffice to provide a formal summary of the set of questions which Aristotle discriminated as necessarily and sequentially involved in the development of a rational comprehension of any aspect of reality whatsoever, and it will be easy in terms of this formal exposition to show in the next section that evolutionary science has in fact unfolded and is progressing along the lines of inquiry and according to the stages marked by Aristotle. Since this has also been true of traditional natural philosophy, it will be clear that whatever be the reason behind the divergent orientations of the ancient and modern species problematics, it is certainly not a consequence of some potent " new logic " dismissing the problems of the " old logic " and substituting for them a diverse type of problem.

Keeping with Adler's phrase for economy, we may say that, according to the notion of methodological behaviorism, there are only four possible questions implied in the attempt to gain adequate rational knowledge of anything at all, and their sense is such that each by being answered poses the next one. These four questions may be stated thus: I) Does a possible subject of investigation exist *(an sit)?* 2) What is it *(quid sit)?* 3) What is unique or distinctive about it *(quale* sit)? 4) Why is it as it is *(propte1·quid sit)* ?

The sense of these four questions and the rationale of their sequence may be stated as follows.

The first of these questions requires that one isolate a subject for investigation. It is mainly a descriptive question. In responding to it, we move through four steps, from an observation of something, to a consideration of the activity which produced or sustains the object, to a postulation of a power or faculty which gives rise to the activity, to a recognition of a nature in which the preceding three are finally rooted. Thus, regularly occurring processes of change and stability are the sign of a natural kind or unit.

Once we know that there is a subject of possible investigation we proceed to an initial determination of what it is. Thus the

second question is a demand £or classification o£ the isolated subject and entails essentially a comparative process in its answer.

In answering this second question, therefore, the third question automatically arises, because in any thorough classification we recognize not only the general features of a subject but also its unique features; and the more thorough our classification the more clearly does the distinctive character o£ the subject classified emerge. Thus the fourth question becomes possible: why does it differ as it does?

The answer to the fourth question is the most difficult, by virtue of the principle that " the simplicity or complexity o£ a question derives from the range of answers that can be given to it"; [42] and it alone constitutes scientific or philosophical knowledge in the strictest sense. Its answer constitutes an explanation in the full sense, because it involves the assignation of reasons for being. In the order o£ nature, however, such reasons are always four, so that, from the standpoint of possible answers, the fourth question is never simple but itself a complex of four questions, which may be simply expressed thus: 1) What is it made out of, or, what is its composition? How is it put together, or, how is it organized? 3) What agents are involved in its production and modification? 4) By what activities does it sustain itself and what are its developmental stages, or, what are its typical modes of behavior?

The " reasons £or being " called for by these questions were the Aristotelian meaning of cause in the general sense and were named specifically the material, formal, efficient, and ' final ' [43]

[41] Adler, *The Difference of Man,* p. 19.

[••] Cf. J. H. Randall, *Aristotle* (New York: Columbia, 1962), p. 229: "'final causes,' as they were developed during the predominance of the religious traditions, tended to become a way of showing how under the ministrations of God's providence everything in the universe conduces to the self-centered purposes of man. In sharp contrast, Aristotle's natural teleology is, in the technical sense, wholly 'immanent.' No kind of thing, no species, is subordinated to the purposes and interests of any other kind. In biological theory, the end served by the structure of any specific kind of living thing is the good-ultimately, the 'survival '--of that kind of thing. Hence Aristotle's concern is always to examine how the structure,

causes, in that order. They constitute a factorial in contrast with a reductive analysis.

These are four kinds of reason, four kinds of answer, four necessary conditions-necessary for understanding the process: we need to know all four if w.e are to find it intelligible. Only one of the four, the By What, the agent, the efficient cause, is a " cause" in the popular sense today-if " cause" have any clear meaning in our ordinary language. The unfortunate neglect of the other three has been due to the dominance of mechanical thinking [and mathematicist explanation of nature] since ·the day of Newton, complicated by the popular heritage of Hume and John Stuart MilJ.[44]

The essential nature of this factorial or " process " analysis was summed up by the ancients in the famous axiom, *causae sunt ad invicem causae* ("causes are causes one to another," or "causes are reciprocally active"). In this way, Aristotle and his followers, both Arabian and Latin, expressed their basic disaccord with Platonism and sought to replace sequences of simple causal or logical (and mathematically perfectly expressible) relations required in absolutizing Forms by organized causal or logical frameworks, which ideally and when complete should be self-contained in the sense of necessitating no reference to anything outside the system.[45]

the way of acting, the ' nature,' of any species conduces toward the preservation of that species, and enables it to survive, to exist and to continue to function in its own distinctive way. This Aristotelian emphasis on the way in which kinds of living things are adapted to their environment brings Aristotle's thought very close to the functional explanations advanced by evolutionary thinkers: in both cases the emphasis is placed on the survival value of the arrangement in question.

" It might be well to add, that such functional and teleological conceptions are just the notions that modern biologists, no matter how ' mechanistic ' their explanatory theory, actually have to employ in describing the subject matter they are attempting to explain. Teleological relations, the relations between means and ends, or ' functional structures,' are an encountered fact. Like all facts, they have to be explained in terms of certain mechanisms that are involved." Cf. further Ernst Mayr, "Cause and Effect in Biology," *Science,* 184 (10 November 1961), pp. 1501-1506.

.. J. H. Randall, *Aristotle,* p. 1!t5: " It is worth noting, incidentally, that the empiricist notion of causation as constant succession, of ' cause ' as the invariable antecedent of its effect, is wholly lacking in Aristotle."

•• Elsasser makes a comment which has bearing in this connection: " to introduce logical complexity on a purely abstract basis ... brings us much closer

It is important to see, in contemporary terms, that such factorial process analysis has a wider reference than the quantitative analysis of various material systems to which cybernetic or " feedback " ideas are applied; [46] such insight depends on a clear grasp of the careful analysis essayed by the ancients of the ontological conditions for reciprocal activation of the causes. Just as their metaphysical analysis showed that the common condition of beings was such that they were both actual and potential under different formalities, so their analysis of physical interactions showed that the same reality can be both cause and effect under certain circumstances. Following Aristotle, Aquinas set the matter forth thus:

> It must be recognized that as there are four causes, two of them correspond to each other because the efficient cause is the *principle* of change and the final cause the *termination* of change; and likewise the other two correspond to one another, for the form *gives* being and the matter *secures* being. The agent thus is the cause of the end, and the end, cause of the agent: the former is true as regards being, because in initiating motion the agent continues to the attainment of a term; while the later is true, not as regards being, but as regards the formality or intelligible character of causality, since the agent is cause insofar as it acts, but it acts only in a determinate fashion, and in this sense has its very causality from the term. Form and matter are causes in relation to each other and with regard to being: the form is the cause of matter by giving it existence, but matter is a cause of form in sustaining it.[47]

Thus, the ancients explained the circularity of natural causation by distinguishing. Causes are reciprocally active, are causes one to another, either according to being (as material

to the preoccupations of the naturalist than we are in the absence of this idea, and it separates us to some extent from the more rigorous methods [but only in the sense of more formally reducible to mathematics and the style of causation mathematics allows for-see Sec. VII below] of the physical scientist."-Atom *and Organism* (Princeton: The University Press, 1966), p. 137.

[46] SeeR. J. Nogar and J. N. Deely, *The Problem of Evolution,* Section IV, The Metaphysical Issues, Third Reading, "The Shape of Biological Thought," by C. H. Waddington, and the Contextualizing Comments thereon.

[47] *In V Met.,* lect. 2, n. 775.

and formal cause), or according to becoming (agent in respect to determinate productions), or according to causality in its intelligible ground (as the effect or end product in respect to the agent) . But not every combination of causes exhibits this circularity of reciprocal activation: only the end and agent (final cause by bounding the agent's efficacy, the agent by exercise) and matter and form (matter by sustaining form, form by actuating matter, so that in mutually communicating they have being as partial principles in the whole itself) . In other combinations, causes need not be reciprocally active.

All this may be summarized in the simple observation that considered in their respective correlations, the four causes refer to the two aspects of every natural subject which must be accounted for in any adequate explanation, namely, its structure and its function; while to say that two things are correlated is merely to say that insofar as one implies the other they cannot be described separately.

Throughout its various stages, of course, methodological behaviorism requires governance by what we now refer to as the principle of parsimony or "Occam's razor," and what the ancients had no catch phrase for but expressed in the proposition "entia non multiplicanda sunt sine necessitate." [48] In this respect, and in this respect alone, there has been a certain variation possible in the logic of rational understanding:

In the case of inert bodies, plants, and non-human animals, the procedures of methodological behaviorism have always been followed by natural scientists, ancient and modern, even though the principle of parsimony has not always been observed and though scientists of an earlier generation are usually regarded by more recent ones as having been fanciful or imprecise with regard to the powers or dispositions they attributed to inert or animate bodies. To say that the procedures of methodological behaviorism

[48] See Bernard Wuellner's references to this under the "principle of economy" in *Summary of Scholastic Principles* (Chicago: Loyola University Press, 1956), nn. 35, 79, Two of Wuellner's formulations of this principle are of particular interest in our context: a) "distinctions between beings and constituents of beings are not to be multiplied without good reason"; b) "Hence, essential or real distinction is not to be affirmed without a clear sign." (p. 79)

have always been followed in the scientific study of natural objects ... is misleading if it allows anyone to think that some other procedure might have been used instead. That is not the case: no other procedure is possible if it is to be scientific in character, and not just an adventure in myth-making. [49]

It is clear, then, that as modes of rational understanding, both science in the modern sense and philosophy (the ancients spoke simply of *scientia naturalis)* must subscribe to so-called methodological behaviorism as the immanent logic of rational understanding. From one point of view, there can be no difference between a philosophical analysis of nature and a study of nature in the scientific sense: all explanation, when it is not mathematical, assigns reasons for being.

Yet from another point of view, there is a sense in which natural philosophy and natural science do subdivide the order of rational knowledge of nature. The question of the difference between philosophy and science and of the relations which their respective explanations sustain is a difficult one which, perhaps more than any other, has exercised contemporary reflections. It is not even agreed among those who treat this question that philosophy constitutes a mode of rational understanding in its own right; but I think that once it is seen that, with respect to the sensible, natural world, just as there are some questions for which laboratory or field research is indispensable (e. g., how does photosynthesis take place? what is the average life-span of a star? or are there extinct life forms?) , so also there are other questions for which such research is adventitious (e. g., what is change? what is chance? how does chance differ from fortune? what is place? in what sense do relations exist?) , then it is necessary to admit that (a) in relation to experience science and philosophy differ between themselves according to the manner in which their respective explanations depend thereon, and that (b) both belong to the order of rational understanding, sharing formally in an identical set and sequence of questions. [50]

•• Adler, *The Difference of Man,* pp. 149-50.

[50] We should recognize, too, that not all questions can be assigned preclusively to either science or philosophy; there are also, so to speak, " hybrid " questions,

This assertion depends, of course, on there being a real analytical distinction between knowledge and experience. That there is such a distinction is plain from the fact that experience functions both as a source and as a test of our knowledge in both philosophy and science, which would be impossible if the two were not somehow distinct. In fact, this difference between experience and knowledge lies at the base of rational understanding, inasmuch as it defines the respective spheres or orders of observation and explanation.

Thus, according to Aristotle and traditional philosophy there is only one logic of rational understanding and only one set of possible questions which this logic imposes. All inquiry takes its start in discovery and finds its realization in the assignation of reasons for being. Of course, one cannot determine in advance the *content* of the answers possible by a purely formal assessment of the eight possible questions: that depends on the structure and diversity of the universe, which is practically infinite. From the side of its content or matter, mankind's knowledge is so extensive that it mocks encyclopedias and overflows libraries; so difficult that a man does well to devote his life to mastery of some part of it; and so incomplete and inadequate that it is subject to endless additions and repeated revisions. But from the side of its form, we have in Aristotle's four scientific questions and four causes the vindication of Bernard Lonergan's contention, " thoroughly understand what it is to understand, and not only will you understand the broad lines of all there is to be understood but also will you possess a fixed base, an invariant pattern, opening upon all further developments of understanding." [51]

questions for which laboratory or field research are superfluous in certain respects and helpful in others-such questions as, what is good for man? what role does chance play in the constitution of the world? or our own problem, what are the natural kinds of common experience?

[51] Bernard J. F. Lonergan, *Insight* (rev. ed.; New York: Philosophical Library, 1958), pp. xxviii and 748. Maritain observes that "from this point of view it may also be said that the work which metaphysics is called upon to do today is to put an end to that kind of incompatibility of temper which the humanism of the classical age had created between science and wisdom." *(The Degrees of Knowledge,* p. xi)

Dewey could well point out that with certain qualifications, " the influence of Darwin upon philosophy resides in his having conquered the phenomena of life for the principle of transition "; but it is noetic nonsense to speak of Darwin as having " thereby freed the new logic for application to mind and morals and life." [52] To demonstrate this it will be sufficient to assay the historical development and theoretical structure of evolutionary biology. To that assay we may now turn.

IV. THE FRAMEWORK OF EVOLUTIONARY SCIENCE

According to the Aristotelian schema, the history of evolutionary biology, like that of any other science, must have passed through three analytically distinguishable phases recognizable in terms of principal (not exclusive) preoccupation successively with the first three " scientific questions," before it reached an incipient maturity wherein reasons for being became the dominant concern. And the extent to which the science at a given time conducts its inquiry into causes along all four of the possible lines will in turn be an index of its degree of maturity. It would be possible to draw an analogy between the predominantly fact-finding phase of the science *(an* sit) and its " infancy "; between the phase preoccupied especially with classifications and definitions *(quid* sit) and the " childhood " of the science; between the brief phase where the distinctive difficulties to be explained come into focus (*quale* sit) and the " adolescence " of the science; and between the phase where the science organizes research along the lines of the difficulties in search of their proper explanations *(propter quid* sit) and the " adulthood " of the science.

This analogy is the more helpful if we realize that even as infancy conditions childhood and childhood adolescence, so even as adults what we are and do remains conditioned by the previous stages. So also in the work of rational understanding. No stage is ever completely surpassed, but different questions come into dominance.

[52] "The Influence of Darwinism on Philosophy," pp. 8-9.

Such, according to the " old logic," is the order of questioning leading to rational knowledge of the natural world, including man. In the rise of evolutionary science, do we find this immanent pattern confirmed, or do we find it supplanted by a " new logic " which substitutes another type and pattern of problems entirely?

For the sake of brevity, and because our main interest is philosophical rather than historical, I think we are justified at this point in taking as our object of analysis a summary of the development of evolutionary science made by one *0,f* the authorities in the field, in lieu of an extended treatment of the primary sources which would deflect too far the thrust of our proper analytic.

I have in mind for our purpose a brief text by Sir Julian Huxley,[53] which will carry us up to the fourth of Aristotle's questions. Huxley introduces his " brief methodological divagation " thus:

> The *method of approach* to any scientific problem is clearly of extreme importance, and will to a large extent determine the type of discovery made. Putting the matter the other way round, the method of approach is itself largely dictated by the type of answer you want to obtain: it is, in fact, a kind of question. Furthermore, the question will alter with time and with the progress of discovery: when one method has yielded the main crop of answers that it could be expected to provide, it is time to ask another kind of question, by adopting a new method.

He then goes on " to summarize the various methods of approach adopted in biology." In this summary, it is not hard to discern the immanent pattern of rational understanding, of Aristotle's four questions.

The question, *An* sit?:

> The original approach inevitably was descriptive: biologists set out to describe as fully and accurately as possible the variety of organisms and the phenomena which they exhibit. This approach is designed to answer the basic question, What are the facts?

[53] Julian Huxley, "Evolution, Cultural and Biological," in *Knowledge, Morality, and Destiny* (New York: Mentor, 1957), pp. 56-84. The cited passages are taken *passim* from pp. 68-70.

The question, *Quid sit?,* in biology was developed in two phases, first on the supposition of the absolute fixity of forms, and then, when classification ceased to be possible on this basis, on the supposition of the fluidity of forms. The important thing to note here is that it was the attempt to answer this classification question that forced the abandonment of the Porphyrian-Linnean classificatory systems and not the introduction of any " new logic " opposed to the pattern Aristotle discerned at the base of rational progress in understanding.

a) The descriptive approach was soon supplemented by the comparative. This was first focussed round the question of grouping or classification. What pattern or system of characters does an assemblage of organisms have in common; and what distinct types are there at the various levels of characterization? This led to the classification of organisms in a hierarchical system of groups-species grouped in genera, genera in families, families in orders, orders in classes, and so on.

b) Implicit in such a system was the idea of physical relationship. With the acceptance of the fact of evolution, this implicit postulate became explicit, and the question posed by the comparative method became correspondingly altered; behind common patterns, men were reaching for common origins. The result was a phylogenetic classification intended to express evolutionary descent and relationships rather than just a convenient pigeonholing system. The animals placed in the order of Carnivora, for instance, were all presumed to be descended from a single common carnivore ancestor, and a common mammalian ancestor was postulated for them and all the other orders placed in the class Mammalia.

Once the phylogenetic character of taxonomic divisions was recognized and the materials rearranged accordingly, the third question, *Quale sit?,* leading to the search for causes, automatically emerged: " However, while common ancestry accounted for the shared resemblances of a group, the problem of the differences exhibited by its members remained."

Thus began the search for reasons for the facts, *Pr·opter quid sit?,* as a dominant phase of evolutionary inquiry:

For this, a new method of approach was needed, a method which we may call that of differential analysis. It asked the question,

What is the cause of the differences between the members of a group? . . . However, there are limits to the usefulness of such differential analytic methods ... we must utilize other methods of approach-constitutive as well as differential, integrative as well as analytic.

What Huxley here refers to as constitutive, differential, integrative, and analytic methods of approach to the question of the reasons for the differences within biological populations are in fact organizing evolutionary explanations according to the formal pattern of Aristotle's four causes. This is perhaps most easily seen in C. H. Waddington's analysis of the entire process of evolution as the intersection of four main sub-processes.54 According to Waddington, further developments of evolutionary theory require incorporating a circular concept of causality, consisting, as he explains, of four basic systems: the genetic system, corresponding analogously to Aristotle's sense of material cause; the epigenetic system, corresponding to formal cause; the natural selective system, analogous to efficient causality; and the exploitive system, corresponding to Aristotle's final cause. "Most biologists at the present day, in expounding evolutionary theory, seem to be content to leave it that the mechanism by which evolution has been brought about is composed of these two major factors: the genetic system with random mutation on the one hand and natural selection on the other. The evolutionary pressures exerted by these two factors are exhibited as being quite external to the nature of the organisms involved." [55] "Now, with such a

•• See C. H. Waddington, " Evolutionary Adaptation," in *The Evolution of Life,* Vol. I of *Evolution After Darwin,* Sol Tax, ed. (Chicago: University of Chicago Press, 1960), pp. 381-402. Also " The Biological Evolutionary System," Ch. 9 of *The Ethical Animal* (New York: Atheneum, 1961), pp. 84-100. Today, notes Waddington ("The Biological Evolutionary System," p. 96), " the recent developments of neo-Mendelian evolutionary theory, which have often been referred to by their adherents as the' synthetic' theory "-sometimes, too, as the neo-Darwinian theory-" have merited that title mainly because of the wide range of the ' evidences for evolution ' for which they could account, rather than for any tendency to exhibit the various factors involved in the evolutionary process as aspects of a unified general system."

•• " The Biological Evolutionary System," p. 88 (see full reference in fn. 54 immediately above).

mechanism," Waddington continues, " it would appear difficult to find any principle which would produce any specific direction of evolutionary change. All evolution would appear to be a purely contingent phenomenon, which just happened to go the way that it did . . . . " [56]

" In my opinion, biology has already made all the discoveries of matters of principle which can be reached by this way of formulating the situation. The time seems to have come when we need to take into account two further aspects of the evolutionary mechanism," [57] namely, the "epigenetic system, which translates the information in the fertilized egg and that which impinges on it from the environment into the characters of the reproducing adult," and " an exploitive system, by which an animal chooses and modifies the environment to which it will submit itself." [58]

" Biological evolution, then, is carried out by an ' evolutionary system ' which involves four major factors," not two. [59]

This formulation of the nature of the evolutionary system incorporates all the features which have been shown to be essential by modern genetics, and brings into the picture nothing to which present day biology can take exception. However, by drawing attention to factors which are often somewhat neglected, and changing the emphasis on others, it issues in an outlook which is of a very different type from that which has been conventional in the

[56] *Ibid.,* p. 89. See the discussion in Section VII of this present article.

[57] *Ibid.* See Section VII below.

[58] *Ibid.,* pp. 94-6. "Very much remains to be done in working out the theory of evolution from this more inclusive point of view. But one general point is already clear. We can now see that the system by which evolution is brought about has itself some degree of organisation, in the sense that its subsystems are mutually interacting, and, in fact, mutually interdependent. In the recent past we have been working with a theory in which the obvious organisation of the living world had to be engendered *ab initio* out of non-organised basic components--'random' mutation, on the one hand, and an essentially unconnected natural selection on the other. We had to rely on a Maxwell demon, and persuade ourselves not merely that natural selection could show some of the properties of such a useful *deus ex machina* but that it had them so fully developed that we needed nothing further. This was a rather uncomfortable position, and we can now escape from it." See Randall's discussion of final cause and the reference to Mayr cited in fn. 48 above, and the discussion on reductionism in Section VII below.

[59] *Ibid.,* p. 94,

last few decades. The theory of evolution, and indeed the whole of biology, has always provided a battleground for two rather contrasting methods of analysis. On the one hand, there is the tendency toward what may be regarded as, in a broad sense, 'atomicity'-an analysis into entities which are independent of one another in their essential nature, and which have, when they interact, only external relations with one another. The alternative approach expects to find that it is dealing with organized systems, in which the factors determine, at least in part, each others' essential characters, and enter into cyclic interaction-systems involving internal relations.[60]

It would be a mistake to consider that what is being asserted here is an explicit recognition on Waddington's part of an Aristotelian pattern as the necessary form of evolutionary theory.[61] It would be an even greater misunderstanding to regard the equation of Waddington's genetic, epigenetic, natural selective, and exploitive systems with what Aristotle termed material, formal, efficient, and final causes as some sort of "concordism."

In fact, it would be impossible to show an equivalence between an empirical formulation and a purely formal pattern, for what is empirical is just what is not or at least is no longer purely formal. The point of the formal notion of the four causes is that they name a *set of relationships* necessarily involved in any phenomenon whatever as understandable. Whether one takes as one's focus of inquiry society, the human person, the extraterrestrial objects of astronomy, patterns of culture-it is

[60] *Ibid.,* p. 96.

[61] In fact, there seems no reason for thinking he is at all acquainted with the Aristotelian treatises on methodology. Waddington finds no perfect parallels of the direction of his thought. In "the type of thinking which I suggest is called for in evolution theory," he writes, "the contrast is not so much between mechanism and vitalism, but rather between mechanism and organicism. Or possibly one could even use the Marxist terms, mechanical materialism and dialectical materialism. The view which I am urging . . . is much more in tune with the thought of Whitehead than with that of Driesch or Bergson." *(Ibid.,* pp. 99-100). Waddington is plainly groping here. My point is that the Aristotelian method provides exactly the parallel he is groping for. Cf. Randall, *Aristotle;* and Ashley, "Change and Process," Second Reading in Part II, Sec. IV of *The Problem of Evolution* by Nogar and Deely. Also Ashley's "Does Natural Science Attain Nature or Only the Phenomena? "

impossible to arrive at an adequate formulation without detailing "structure" (with its correlative "composition" and "organization"), which is the immediate referent of cause as material and formal; and "function" (with its correlative "agent" and "product"), which is the immediate referent of cause as efficient and final.

Thus when we are told that "in modern evolutionary studies, concern has shifted from the organism as a describable object to the more sophisticated view of it as a morphological expression of the genetic and environmental status of an evolving population" [62] (for the very good reason that "in sexual organisms," which are the majority by far, "Mendelian populations, rather than individuals, have become the units of the adaptively most decisive forms of natural selection" [63], it is certain that these populations, in order to be intelligible, must be seen as possessing a structure and typified by a function, involving composition, organization, activities, and determinate results; and that none of these aspects may be left out or treated as peripheral if our understanding as rational is to be adequate to the reality.

But this is exactly the point of Waddington's formulation of biological evolution as involving four major factors, not just two.

Moreover, the fact that in modern evolutionary studies concern has shifted away from the organism as a describable object should not be used-as it unfortunately sometimes is-as a flight from the organism as a describable object rationally intelligible in its own right as structured and functional; for as a matter of fact, the whole element of necessity in the view of populations as evolving devolves upon the structural stability of the organism "as a describable object." In short, populations are labile only by reason of the fact that the individual organism taken as such is stable.

[62] Glenn L. Jepsen, "Foreword" to *Genetics, Paleontology and Evolution,* edited by Jepsen, Ernst Mayr, and George Gaylord Simpson (New York: Atheneum, 1963), p. ix.

[63] Dobzhansky, *Genetics and the Origin of Species,* p.

Since the whole character of evolutionary studies as scientific depends on this point (science, after all, is of the necessary: that is what it means to assign causes-to see why the facts are as they are and not otherwise [64]), it is important to be clear on what is at issue here, before passing on to a statement of specific structures in an evolving world.

When Waddington tells us that to take explicit account of the epigenetic and exploitive systems is a matter of changing the emphasis on the factors natural selection and mutation by drawing attention to neglected factors and of seeing why the automatic character of the evolutionary process is not external to the nature of the organisms involved, I think he is doing no more than recalling that the rational explanation of the individual organism as a morphological expression of the status of an evolving population logically involves the possibility of a rational understanding of the individual organism as a describable object which is the subject of processes. Put otherwise, if the individual organism as a describable object is the morphological expression of an evolving population, then that individual organism itself must be rationally intelligible as undergoing constant change. But in any such analysis it will

•• Moreover, for those philosophers who flatly assert " there is no science of the singular" (usually, it is worth adding, philosophers who hold for a large number of *infima species* in the scholastic sense), it is worth pointing out that in the first place, "nihil est adeo contingens, quin in se aliquid necessarium habet" *(Summa,* I, 86, 3)-which translates, "there is nothing so contingent that it has no aspect under which it may be seen as necessary " (another way of saying that the principle of causality holds absolutely throughout the order of finite being)-and in the second place, *ubi necessitas, ibi scientia possibilis.* See the remarks on this connection in "Evolution as World-View and as Philosophy," esp. sec. C, in *The Problem of Evolution* by Nogar and Deely. In the particular context of biological evolutionary theory, for example, Dobzhansky points out that today, "biology not only recognizes the absolute individuality of every person and every living being, but in fact supplies evidence for a rational explanation of uniqueness" *(Mankind Evolving,* New Haven: Yale, 1962, p. 29), without denying that, from the scientific standpoint, " the uniqueness and unrepeatability of individuals are aspects falling primarily within the province of philosophers and artists" *(Genetics and the Origin of Species,* p. 4)-well, of artists anyway. See further Gardner Murphy's remarks on "The Consequences of Mutations" in *Human Potentialities* (New York: Basic Books, 1958), pp. 228-31; and Gordon Allport's study of *Becoming* (New Haven: Yale, 1955).

be necessary to take account both of the structure and of the function of the individual organism; for *to* say it is a " describable object" (albeit not the principal center of interest in the evolutionary process as a whole) is *to* say that it has parts put together in a certain way (material and formal cause) as the result of certain agencies working through certain stages (efficient and final cause). Thus the fact that populations as describable objects have a recognizable structure and function is possible only by reason of the fact that the individual members of the population have them first.

This may seem an obvious point, but it is one which is in practice overlooked by any formulation of the evolutionary mechanism which singles out the genetic system with random mutation and natural selection as the sole principal factors, to which the functioning of individuals is subordinate and secondary. To see the functionings of the individual as a mere part of the selective process and not as forming a distinct major evolutionary factor in its own right, in short, inevitably distorts one's conception of the real workings of the evolutionary system as a whole.

This is clearly illustrated in Simpson's proposition that at the descriptive level, " natural selection is the only objectively established antichance evolutionary factor." [65] The individual as a describable object plainly lies "at the descriptive level"; and the individual as the morphological expression of the genetic and environmental status of an evolving population is plainly an evolutionary factor. But the development of this individual as such is not a mere random transition; it is a definite passage from fertilized ovum to mature adult, turning circumstance so far as possible to its own benefit for becoming *what it can be and potent-ially is.* Consequently, the individual is not only an evolutionary factor at the descriptive level; he is veritably an *anti-chance factor.* Underlying the long-range adaptive population trends controlled by the natural selective system lies in every case the phenotype which is adaptive, but

[65] George Gaylord Simpson, *This View of Life* (New York: Harcourt, 1963), p.

which is under the *direct* control not of the natural selective system at all but of the epigenetic system. There are two anti-chance factors in evolution, therefore, both located at the descriptive level: one at the level of the individual organism as *such-epigenesis,* the source of homeostasis and teleonomy; and another at the level of populations-natural or evolutionary selection, the process whereby the occurrence of favorable mutations increases the adaptive fitness of organisms to meet the requirements of their environments and subsequently to better survive and reproduce.

Thus the adaptive flexibility and evolutionary advance observed at the level of the population is only possible by reason of the structural stability and limited adaptive range of the individual organism; and the fact that in modern studies concern has shifted away from the individual organism ought not to blind us to the implications of the fact that species evolve through individual reproductions of organisms as " describable objects." As Dr. Nogar among others has pointed out:

> Although it is true that the path of evolution is best traced in paleontology, the process by which evolution has taken place must be found in the individual reproductions of organisms. Species evolve through individual generations, *even though whole populations are involved in the total process of species change.* The method, often called the mechanics of evolution, is not treated by paleontology but by the sciences of heredity *and development.* What actually takes place in the process of change which is called evolution can only be ascertained by those sciences which study the origin *and development* of individual organisms [or better, *not without* them]. [66]

•• Raymond J. Nogar, *The Wisdom of Evolution,* pp. fl90-91: "There are many departments of biological science which contribute to an understanding of the origin and development of organic systems. It is true that ultimately the problem of evolution concerns only *heritable* characters. Among the developmental sciences, certainly *genetics* plays a dominant role today. Genetics is classically defined as *the science of variation and inheritance in organi:nns.* Its object is to determine to what extent the variable characters of plants and animals are inherited from parents to offspring, to what extent they are from environmental influence, and by what biological mechanisms such characters are transmitted from generation to generation. But the problem of development of organisms is much more broad than these considerations. *Cytology,* the study of the cell, *embryology,* the study of the

Probably there is no way to make this point clearer than by considering directly in what manner evolutionary studies meet the ancient requirement that science be of the necessary. In what sense is evolution a *necessary* and not merely *contingent* fact? In what sense does the idea of evolution intend an aspect of reality which does not just happen to be as it is but could not be otherwise?

The answer to this question is not far to seek. It lies in what Dobzhansky has described as " the splendid simplicity and deductive character of the idea of natural selection." [67] In fact, the core of evolutionary theory, that aspect of the science which expresses the root necessity behind the evolutionary character of reality, may be expressed in a quasi-syllogistic; involving four facts of observation and three immediate deductions therefrom. [68]

First Fact: the reproductive prodigality of the biotic community. This says that all organisms tend to increase in a geometric ratio (a crucial factor, it may be noted, in a species' survival of recurrent catastrophes of disease and weather) .

Second Fact: population constancy. Generally, the numbers of adults in the populations of any given area remain relatively constant from year to year; and what increase or decrease can be observed is arithmetic, never geometric.

First Deduction: the " struggle for existence," a metaphorical expression for the deduction which follows from the above data, namely, that natural populations, though locally variable to some degree, remain so far short of their reproductive potential that there clearly is in each generation an excess of offspring that fail to attain reproductive status. Due to the limited

growth of the embryo (seed) to maturity, and *phylffology* of growth axe all involved in the full developmental picture. All the facets of reproduction, heredity and development axe at issue in the question of individual origins." Thus even this list of the disciplines involved is but representative and not at all exhaustive.

[67] Theodosius Dobzhansky, *!vfankind Evolving,* p. 130.

[68] The following analysis is largely an amplification and development of the structure of argument suggested by Julian Huxley in the recent re-edition of his classic, *Evolution: The Modern Synthesis* (New York: Science Editions, 1964), pp.

economic resources of any given ecological niche or environment, " reproduction results in more offspring being reproduced than can survive to reproduce again; and this in tum results in what Darwin called the struggle for existence." [69]

In essence, this "struggle for life" is convertible with the positive orientation of each organism toward self-development and reproduction:

> Thus trees " struggle " against the danger of being felled by wind by developing stronger root systems; mammals and birds " struggle " against cold by developing heat insulation, temperature regulation, or by remaining dormant during winter months; desert plants "struggle" against dryness by having leaves transformed into spines. Plants and animals " compete " for food when food is scarce, but they do not necessarily fight against one another. [70]

Depending upon the adaptive exigencies prevailing at any given time, living beings may " struggle for existence " not only by fighting each other but also by helping each other; and in fact " competition in evolution often or usually is entirely passive." [71]

Epigenems, the pomtive, dynamic orientation of each individual organism toward self-development and perpetuation through progeny: " Here is the crucial point in the conceptual scheme which Darwin gave to biology. The apparently designed nature and purpose of living organisms . . . is all ultimately directed at survival in order to reproduce." [72] Yet the

[69] Julian Huxley, *Evolution In Action* (New York: Mentor, 1953), p. 33. Conversely, of course, "any living species, race or population tends to expand in numbers as soon as it encounters a favorable environment." (Dobzhansky, *Evolution, Genetics, and Man,* New York: Science Editions, 1963, p. 333). Australians are among the more vocal witnesses of this phenomenon.

[70] Dobzhansky, *Evolution, Genetics, and Man,* pp. 112-13.

[11] George Gaylord Simpson, *The Meaning of Evolution* (New Haven: Yale, 1949), p. 222 fn. 3.

[12] G. G. Simpson, C. S. Pittendrigh, and L. H. Tiffany, *Life: An Introduction to Biology* (New York: Harcourt, 1957), p. 34. On the metaphysical dimensions of this formulation, see Jacques Maritain, *A Preface to Metaphysics* (New York: Mentor, 1962), " The Principle of Finality: First Aspect," pp. 103 fl'.; and "The Principle of Finality (Second Aspect) ," pp. 107 fl'. See also fn. 160 of "Evolution as World-View and as Philosophy" in Nogar and Deely, *The Problem of Evolution,* on natural selection as a definition of the role of chance in the constitution of nature.

notion of an intrinsic source of structure and function produced by the generator in the process of generation and which establishes both the tendency for development and limitations of the generated's capacity for development is just that sense of "nature" which has always been fundamental for traditional philosophy. [73]

Third Fact: Appreciable variation. This is simply a pointing out that the struggle for survival in nature is not among identical individuals but is waged among organisms which are slightly different at least from one another.

Second Deduction: differential elimination. By taking the first deduction in conjunction with this third fact, we have the premises for a deduction that there is a differential elimination of the offspring in each generation: on the average, organisms with unfavorable variations will be eliminated in greater numbers than those with favorable variations. " The statistical probability of survival or elimination, despite accidents, will depend on the degree of adaptedness of individuals and groups to the environments in which they live "; [74] and even a very high percentage of non-selective or random elimination in no way invalidates the general selection principle from holding for the remaining fraction.

By way of historical comment, we may note that this largely negative process of differential elimination was what Darwin originally termed " natural selection " and proposed as the mechanism of the evolutionary process. But elimination of the less fit does not make the more fit novelties, and an evolutionary mechanism which eliminates without explaining how the

[73] See Raymond J. Nogar, " Evolution: Scientific and Philosophical Dimensions," in *Philosophy of Biology,* V. E. Smith, ed. (New York: St. John's University Press, pp. esp. pp. 49-63; also Benedict Ashley, "Change and Process" in Part II, Section IV of *The Problem of Evolution;* James A. Weisheipl, *Nature and Gravitation* (River Forest, Ill.: Aquinas Institute, 1955); and "The Concept of Nature," *The New Scholasticism,* XXVIII (October, 1954), pp. 377-408; "Natural and Compulsory Movement," *The New Scholasticism,* XXIX (1955), pp. 50-81; "Space and Gravitation," *The New Scholasticism,* XXIX (April, 1955), pp. See also fn. 77 below.

[74] Dobzhansky, *Mankind Evolving,* p.

more suitable variants are linked with the processes of biological inheritance could not in the end account for genuine origins of species. What eluded Darwin to the end was a satisfactory explanation of how a variation arising within a given population would be preserved from reabsorption-like a drop of ink in the ocean-in the succeeding generations. How could surface variability be radical? What was required was a stable basis within the inheritance factors, and the factors of inheritance were unknown when Darwin published (unless you happened to live in the right monastery and also be Monk Mendel's friend) , save for the ancient and general axiom, *generans generat simile sibi.*

Thus, between natural selection as first proposed by Darwin and the concept of selection put forward today in the evolutionary synthesis, " the great biological fact of inheritance makes all the difference." [75]

Fourth Fact: particulate inheritance. Mendel's discovery of the particulate nature of inheritance held the answer to

Pittendrigh, and Tiffany, *Life,* p. 88. Cf. C. H. Waddington, "Evolutionary Adaptation," in *The Evolution of Life,* pp. 385-6: "The development of evolutionary theory in the last hundred years has in fact proceeded along quite other lines. Darwin's major contribution was, of course, the suggestion that evolution can be explained by the natural selection of random variations. Natural selection, which was at first considered as though it were a hypothesis that was in need of experimental or observational confirmation, turns out on closer inspection to be a tautology, a statement of an inevitable although previously unrecognized relation. It states that the fittest individuals in a population (defined as those which leave most offspring) will leave most offspring. Once the statement is made, its truth is apparent. This fact in no way reduces the magnitude of Darwin's achievement; only after it was clearly formulated, could biologists realise the enormous power of the principle as a weapon of explanation. However, his theory required a second component-namely, a process by which random hereditary variation would be produced. This he was unable himself to provide, since the phenomena of biological heredity were in his day very little understood. With the rise of Mendelism, the lacuna was made good. Heredity depends on chromosomal genes, and these are found in fact to behave as the theory requires, altering occasionally at unpredictable times and in ways which produce a large, and, it is usually stated, 'random' variety of characters in the offspring bearing the altered genes. On these two foundations,-natural selection operating on variation which arises from the random mutation of Mendelian genes-the present-day neo-Darwinist or ' synthetic' theory of evolution has been built up."

Darwin's dilemma over the origin and the stability of novelties. Research along Mendelian lines revealed that the sex cells contain the sum total of physical heredity, and that within the sex cells the specific carriers of heredity are self-replicating molecular entities called *genes.* Although these function as interacting and cooperative sets in the unit-organism's development by controlling the metabolic pattern as such, they are transmitted (and therefore inherited) as more or less discrete, unblending units. Once it had become known that biological heredity is basically "the transmission of self-reproducing entities, genes," [76] and the Mendelian laws had revealed that during the process of hereditary transmission the genetic units do not blend but segregate, recombining more or less randomly in the establishment of the hereditary endowment or "genotype" of a new organism, [77] the problem of a stable hereditary basis for novel variations became soluble. Here, in the particulate character of hereditary transmission, lay precisely "that point in the process of origins whereby the relation between the generator and the generated can be investigated and conceptualized." [78]

In order to find a stable basis for novelty, and so understand the inception and possible sustainment of evolutionary change,

[16] Dobzhansky, *Mankind Evolving,* p. 77.

[11] The totality of the genes an organism possesses is referred to as its genotype or genetic endowment. The genotype is contrasted with the so-called phenotype, which is not transmissible biologically and comprises the total of everything that can be observed or inferred about an organism excepting only its genes. On the basis of this distinction, which is altogether fundamental to the understanding of heredity, it follows that the total range of phenotypes which a given genotype can engender in all possible environments constitutes the norm of reaction of the genotype, so that whatever change is induced in the phenotype is of necessity within the norm of reaction circumscribed by the genotype, i.e., fixed in the zygote at fertilization. Thus the limitation on any given organism's substantial developmental variation potential, its reaction range, is established once and for all at the moment of that organism's genetic origin. "No matter what the prehistory might be;' writes Nogar, "there remains a stable, unique, and typical order in the process of generation which gives to the entity both its capacity and its limitations for development." ("Evolution: Scientific and Philosophical Dimensions," p. 58. See further references in fn. 73 above.)

[78] Nogar, "Evolution: Scientific and Philosophical Dimensions," p. *55,* italicized.

one need know nothing about the parents who mate beyond the sex cells which they produce.

In this narrowed perspective it became relatively easy to identify the imprecise or " mutant " gene as the ultimate source of all heritable variation, and so the root of evolutionary novelty at the adaptive level. " Since all developmental processes are gene controlled, any morphological or physiological trait may be altered by mutation." [79]

A mutation is simply a gene which has replicated imprecisely without losing the capacity to further reproduce. [79a] In this way what was originally a variant becomes a strain, and what in a parent organism was "essentially a dislocation taking place in the delicate self-reproducing mechanism of the gene " [80] may become for succeeding generations " the origin of an hereditary trait which did not exist at all in the parents of the mutant." [81]

The frequency, range, and nature of genetic mutations have

[79] Dobzhansky, *Genetics and the Origin of Species,* p. Moreover, it is known at present that mutations form a spectrum, ranging from drastic changes lethal in early development stages to changes so minute that their detection presents serious technical problems. In fact, a great majority of mutations cause no changes in the chromosomes visible under even the best microscopes; so that one will obtain at best a grossly distorted picture of the characteristics of the mutation process if he restricts his observations to the data of "common sense" and only considers mutational changes in their phenotypic manifestation, that is, only by reference to visible departure from the ancestral condition in the structural and physiological characters. Since, as we shall see below, the effects of the mutation process on organic evolution are cumulative, it would hardly be possible to achieve a clear understanding of the evolutionary progression if one were unaware of the presence of slight mutants which, at any given time level, remain invisible to the unaided eye for the simple reason that they fall within the ' normal ' range of individual variability.

[79a] In many respects, the nature of mutation remains profoundly mysterious. So far as has been determined, genetic mutation " is a random affair, and takes place in all directions," often manifesting itself " as uncaused or at least as unpredictable as the jumping of an electron from one orbit to another inside an atom." (Huxley, *Evolution in Action,* p. 36.) About all that we can say with assurance is that the extreme atomic complexity of the genetic unit linked with a high sensitivity to forces external to itself (i.e., by definition, to environmental forces) makes it inevitable that the self-copying process will be occasionally inexact.

[80] Dobzhansky, *Evolution, Genetics, and Man,* p. 107.

[81] L. C. Dunn and Theodosius Dobzhansky, *Heredity, Race, and Society* (rev. and enlarged ed.; New York: Mentor, p. 77.

been the object of many special studies and are far from being exhaustively understood.[82] What is clear, however, is that mutation is the *ultimate* source of all hereditary variation. Thus Simpson can say that" modern geneticists have supplied what seems to have been the last lacking basic information necessary for an explanation of evolution essentially complete on, at least, the descriptive level."[83] For, if the forms of the universe are immanent, and not transcendent principles separate from matter, the constancy and variation of natural kinds center around the relationship between the parent and the progeny; and just as species as existing kinds can be no more fixed than this relationship, so our ideas of them ought to be " no more and no less permanent, stable, unique, and constant than the relation of generator-generated manifested under closest scrunity."[84]

For the sake of the larger philosophical context, a digression here seems called for again with regard to Dewey's assessment of the conflict between modern science and traditional philosophy over the permanence of species. Earlier I suggested that Dewey seemed to have misunderstood or missed entirely the nature of the doctrinal dispute between Plato and Aristotle.[85]

[82] Without being able to go into the matter here, we may at least note in passing that recent advances in research on the DNA molecule have led to some dramatic breakthroughs in our understanding of the genetic structure and function. A very readable account of the background of recent researches in this area which requires no technical kno\vledge to follow can be found in Theodosius Dobzhansky, *Heredity and the Natu·re of Man* (New York: Harcourt, 1964). Also Isaac Asimov, *The Genetic Code* (New York: New American Library,
A more techincal account can be found in B. Wallace and Th. Dobzhansky, *Radiations, Genes, and Man* (New York: Holt, 1959).

[83] George Gaylord Simpson, *This View of Life* (New York: Harcourt, 1963), p.

[84] Raymond Nogar, "Evolution: Scientific and Philosophical Dimensions," p. 59.

[85] See fn. 39 above for references. It might be added here that, according to a recent study by Frederick M. Anderson, "Dewey's Experiment With Greek Philosophy" in *International Philosophical Quarterly,* VII (March, 1967), pp. 86-100, "In all of his writings about the Greek philosophers, there is but one essay by Dewey that contains some sustained study of specific writings: John Dewey, ' The "Socratic Dialogues" of Plato,' in *Studies in the History of Ideas* (New York: Columbia Univ. Press, II, (Anderson, fn. 1 p. 86). One may reasonably suspect that Dewey lacked the inclination or information or both to grasp the nature of the dispute in philosophy of nature between Plato and

Here this suggestion can now be laid bare in its ground. In metaphysics, their disagreement was but the conflict between the answers they gave as mathematical interpreter of nature and naturalist or philosopher of nature, respectively, to the question as to where the properties of natural objects are to be verified, in a world of ideas knowable with mathematical precision and certitude, or in the changing world of nature itself? Are the forms of entities themselves things or only principles of things? How to interpret the universal datum, *agens facit simile sibi, omne generans generat simile sibi?* Both Aristotle and Plato forthrightly posited the eternity of species for there was then no known evidence to the contrary; but they characteristically differed in their respective explanations of this fixity. Plato assigned it to noetic reasons and defended it in terms of the requirements of intellectual understanding. Aristotle, without denying that science bears on the necessary, assigned the fixity of forms to their stable and unchanging environment-the eternal heavens. His ecology was wrong, but he looked to the right source and conceived the relationship between permanence and instability of natural kinds rightly in giving the universal axiom, *agens facit simile sibi,* an absolutistic interpretation, as Dobzhansky observes:

> *If the environment were absolutely constant,* one could conceive of formation of ideal genotypes each of which would be perfectly adapted to a certain niche in this environment. In such a static world, evolution might accomplish its task and come to a standstill; doing away with the mutation process would be the ultimate improvement. *The world of reality is, however, not static.* A species perfectly adapted at present may be destroyed by a change in the environment if no hereditary variability is available in the hour of need. Depending upon the speed and character of environmental changes, and also upon the reproductive biology of the species, greater or lesser mutability will be favored. The store of potential variability, and the rate at which the potential variability becomes actualized will be controlled by natural selection [in the sense to be defined in our Third Deduction below].[86]

Aristotle. See further John Anton, "John Dewey and Ancient Philosophies," *Philosophy and Phenomenological Research,* 25 (1965), pp. 477-499.

[86] Dobzhansky, *Genetics and the Origin of Species,* p. 74, emphasis added. See fn. 15<1. *infra.*

Thus Dr. Noga.r could point out tha.t "surprisingly enough, the £unda.menta.lissues involved in the doctrinal differences between Plato's system a.nd Aristotle's view a.re raised again toda.y by the advances o£ evolutionary theory." [87] Yet, as Ashley a.lso points out, " the Thomists who toda.y are the main proponents o£ this position "-i.e., Aristotle's position-" often seem to express it in a. ma.nner which tends ba.ck towa.rd the Platonic view tha.t Aristotle opposed." [88] In this light, a.s Adler comments, "we ca.n discount what is excessive in Dewey's statement ... but we must a.lso remember that, in Darwin's time a.nd even today there wa.s a.nd is the ' scholastic ' position, claiming the authority o£ Aristotle and St. Thomas, which ... overemphasizes, a.s well a.s misloca.tes, the immutability of na.ture." [89]

[87] Nogar, *The Wisdom of Evolution,* p. 316. This is spelled out in philosophical and historical detail in the essay on "Evolution as World-View and as Philosophy," esp. div. II, ' From classical antiquity to Darwin's world,' Part I of *The Problem of Evolution* by Nogar and Deely.

[88] Ashley, " Change and Process," Third Reading in Part II, Section IV of *The Problem of Evolution.* Ashley goes on to say: " In spite of this commitment to a view of nature which emphasized its dynamism, Aristotle and the medieval Aristotelians failed to follow out its full implications. They were restrained both by the lingering influence of Hellenic religious attitudes and by the actual state of astronomy in their day which had been developed under Pythagoreans and Platonists. This astronomy accepted the mythological view that the cosmos is divided into two fundamentally different regions, the sublunar region in which alone radical change can take place, and the heavenly spheres in which no change can take place, except pure mechanical change (the frictionless motion of the unalterable spheres, motion which is absolutely uniform and capable of perfect mathematical expression) . Thus mechanism and mathematicism were realized in the principal parts of the universe, while dynamic naturalism applied only to a restricted and inferior region. This drastic restriction of dynamic naturalism in Aristotle's world view survived through the middle ages. St. Thomas Aquinas recognized it as hypothetical rather than definitive, hut Thomists abandoned it only reluctantly as modern science made it completely untenable. Contemporary Thomists have made only a feeble effort to rethink the consequences of the Aristotelian view of change for the modern world-picture, and have been largely content to argue that changes in empirical science cannot affect the metaphysical principles of Thomism, which, it is claimed, rest on a superior ground."

In this respect, see Sections VI and VIII below.

[89] Adler, *The Problem of Species,* p. E. g., see Desmond Murray, *Species Revalued* (London: Blackfriars, 1955).

We shall pick up the thread of what is here in the nature of digression when we come to Sec. VI below; for the present it suffices to note that, for the philosophy authentically recognized as traditional,

> nature is a principle, that is to say a relation of the generator to the generated, and *cosmic natures are no more fixed than this relation.* True to the Aristotelian principle that there is no other way to know how fixed this relation is than to observe nature, Aquinas and his students repudiated, in theory, the Platonic tendency to identify temporal natures with eternal essences.[90]

In the absence of the beneficent regularity of the celestial spheres as *causa regitiva* of generations and corruptions in this sublunary region, therefore,

> nature, as the relative relation of the generator to the generated, parent to the progeny in organic beings, is *dynamic and changing,* and must be conceived as of the temporal order. It is important that the permanence and stability of natural bodies be acknowleged, for regularity and unicity of type are evident. But the permanence and stability, even of species, is no greater than the stability of the relation of the generator to the generated. A mathematical or metaphysical conception of essence as an absolutely fixed and eternal idea cannot be superimposed upon natural bodies, except in the sense of an ideal (logical) type, and one must be careful here not to drift into the idealism of Plato and imagine that the real horse is the idea, and the domestic horse is but a shadow of reality. As an archetype or idea, the horse can be conceived of as free of the ravages of time, but the natural history of the horse family shows it to be about 60 million years old with an estimated evolutionary rate of 0.15 genera per million years.[91]

Summing up, then, our "fourth fact," the discovery of the particulate nature of biological inheritance, we may simply say

[90] Nogar, *The Wisdom of Evolution,* p. 318, emphasis added. Nogar has particularly in mind the text of Aquinas's *In 11 Phys.* The core of Dr. Nogar's interpretation, which rests on a scholarly grasp of the continuity of the philosophical project across the dimensions of history, is a strictly philosophical contention, namely, that evolutionary science is a substantial development but not a destruction of the root principles structuring the Aristotelian *Physica.*

[91] *Ibid.,* pp. 318-9.

that " mutation causes changes in the genes and variants of the gene structure; these are the raw materials of evolution. In those organisms which reproduce sexually, these variants are combined and recombined to form countless different genotypes." [92] Thus, "if self-copying serves as the basis of continuity and specificity in life, and reproduction generates its expansive force, mutation is the ultimate source of all its heritable variation." [93]

The principles of heredity, then, plus the datum of mutation, constitute what is referred to as " the great biological fact of

[92] Theodosius Dobzhansky, *The Biological Basis of Human Freedom,* (New York: Columbia, 1956), p. *56.* See *Genetics and the Origin of Species,* p. 8: "The number of conceivable combinations of genes present in different organisms is, of course, immense. The actually existing combinations amount to only an infinitesimal fraction of the potentially possible, or at least conceivable, ones. All these combinations may be thought of as forming a multidimensional space within which every existing or possible organism may be said to have a place."

•• Julian Huxley, *Evolution in Action* (New York: Mentor, 1953), pp. 33-4. In this connection, Simpson finds it " a rather astonishing observation that the supply of this basic material for evolution seems to have no particular relationship to the demand," i. e., that " the results of mutations do not tend to correspond at all closely with the needs or opportunities of the mutating organism." *(The Meaning of Evolution,* p. 164.) But is this really so astonishing? Alluding to the same fact, Dunn and Dobzhansky make the following comments *(Heredity, Race, and Society,* pp. 81-!'l): "Perplexing questions which may then be asked are these: Why should harmful and useful mutations occur indiscriminately at all times? Would it not be vastly more advantageous for life and for its evolution if only useful mutations were to take place only when and where they are needed? " " The answers to these questions are not difficult. This is not a perfect world. Mutations are changes ... which alter the structure of the genes and their effects on body or mind. To produce only mutations that would be useful in the environment in which the descendants of a given individual are going to live would require the genes not only to possess wisdom but foresight. This is just too much to expect and, in any case, nature has not seen fit to endow mortal creatures with providential powers. All kinds of mutational changes of which a gene is capable do occur in it or in its descendants, given the vast stretches of time through which the hereditary material continues. A few of these changes will be useful to the organism in some environments. A majority of changes will be harmful, just because tinkering with a delicate mechanism is more likely to spoil it than to improve it. A more biological reason is that the mutations which are useful in today's environments took place in the past and have become incorporated in the ' normal ' hereditary constitution." " Harmful mutations and hereditary diseases are thus the price which the species pay for the plasticity which makes continued evolution possible." See further Dobzhansky, *Genetics and the Origin of Species,* p. 83.

inheritance": some variation has a stable basis radicated within the inheritance factors, and that fraction is available for transmission to subsequent generations.

By taking this fact in conjunction with the second deduction (differential elimination) , we have the premises for a third and final deduction, and we are in a position to circumscribe the element of necessity in the idea of evolution.

Thi1·d Deduction: evolutionary selection. Since Darwin coined the phrase " natural selection " precisely to fit the second deduction above, which reveals less the creative and positive thrust of evolutionary change than it does the conservative and negative phase of the process, since, too, this idea carried over into the social order as a pseudo-scientific support for a vicious philosophy of " social Darwinism," since, moreover, we are separted from this Darwinian prototype of evolutionary explanation by decisive discoveries and a hundred years, even though Julian Huxley insists that "biologists may with good heart continue to be Darwinians and to employ the term Natural Selection," [94] it seems to me historically less ambiguous and philosophically more exact to leave the term " natural selection " to history and to designating the aspect of reality for which it was so exactly tailored to fit, and to express the conceptual keystone in the structure of the modern synthesis in a different phrase, more precise because in turn tailor-made to fit the new aspect of reality which post-Darwinian research brought to light with so much labor. Rather than continuing to speak of natural selection, therefore, I submit we should prefer the phrase *evolutionary selection* to intend the realization that *there must be a differential transmission of inhe·rited variation, so that automatically " the hereditary endowment of the succeeding generations will differ from that of the preceding generations in the direction of superior fitness"* [95]-oE greater chance of reproductive success. This is so because inheritable variations, no less than non-inheritable ones, inevitably differ in the degree of biological

•• *Evolution: The Modern Synthesis,* p.
•• Dobzhansky, *Evolution, Genetics, and Man,* p. IU.

advantage they confer-in other words, in their survival value; and so the struggle for survival results in their differential elimination-in Darwin's words, natural selection; but differential elimination for one organism is differential survival for another, and so natural selection clears the field for the transmission of adaptively superior heritable variations-in other words, for evolutionary selection. Thus in modern theory the emphasis is not on differential survival but on differential transmission, on reproduction. [00]

Since, however, biologists continue to prefer the original Darwinian expression, notwithstanding this altered sense, it is important to be clear in one's own mind what is intended:

> The term Natural Selection thus is seen to have two rather different meanings. In a broad sense it covers all cases of differential survival [second deduction]; but from the evolutionary point of view it covers only the differential transmission of inheritable variation [third deduction].[97]

The existential stability of life forms, then, is seen to depend on the pattern of generation or reproduction, which is itself determined by the ecology, the relation to environment, of any given form. As the ecological resources change, beyond certain adaptive limits the life-form must itself change correlatively, or suffer extinction. The rhythm of successful adaptive change cannot be faster than the rhythm of the environmental change; it may even be somewhat slower. But anyone who has watched for the disappearance of his local mountain range or for the onset of a new ice age knows that the argument against the mutability of particular forms, be they oysters or elephants, on the grounds that " like generates like," is either naive or the last hurrah of scholastics whose thought bears witness to a cultural unconscious wherein the eternal heavens still have their implications for the changes which occur below the moon.

[96] Mayr, in his *Animal Species and Evolution,* comments: "Therefore, modem evolutionists include in natural selection any factor that contributes to differential reproduction " (p. 183). To see the necessity in the process is one step, to explain it adequately, another: it is for this second step that Waddington's qualifications are in line.

[97] Huxley, *Evolution: The Modern Synthesis,* p. 16.

The perspective of the geologist together with that of the geneticist reveal what may well be termed by the philosopher the basis for the prior possibility of paleontological data:

> The process of adaptation may be looked at as a series of conflicts between the organism and its environment. The environment is in a state of flux, and its changes, whether slow or rapid, make the genotypes of bygone generations no longer fit for survival. The ensuing contradictions can be resolved either through extinction of the species, or through reorganization of its genotype. [98]

Mutations, however, "create genotypes that have not gone through a process of adjustment in the evolutionary history"; [99] so that there is no need to conceive of the potential variability of a natural kind as restricted within the boundaries of some "original type" (usually conceived as an immediate creation of God) , and to go on from this gratuitous postulation to observe that " the substantial form would then be viewed as an ontological impulse realizing itself in various patterns along the line of a certain phylum." [100] Such evolution could, indeed, " only take place within the limits of the phylum or the ontological species in question." [101] Yet as the author of this view himself has elsewhere well remarked, " the proper task of a straightforward philosophy is to assign the reasons for what is given to it and to gain an understanding of that datum, not to 'elucidate' a universe of fictions," be they possible or not. [102] It is therefore not only scientifically more exact but, in the light of available evidences, philosophically more sound to simply remark that " evolution is possible because some mutants and their combinations happen to produce adaptively valuable

[98] Dobzhansky, *Genetics and the Origin of Species,* pp. 73-4.

[99] *Ibid.,* p. 83.

[100] Jacques Maritain, " Substantial Forms and Evolution," in *The Range of Reason* (New York: Scribner's, 195:2), p. 37.

[101] *Ibid.,* pp. 37-8.

[102] Jacques Maritain, *The Degrees of Knowledge,* trans. from the 4th French ed. under the general supervision of Gerald Phelan (New York: Scribner's, 1959), p. 106. As I shall try to show in Section VI below, it is a question here of how seriously one is to take the principle of parsimony. See fns. 161 and 163 *infra.*

phenotypes [epigenetic systems] in environments which the species encounters in space or in time." [108]

Dobzhansky is unusually vehement in making this last point. "Evolution is change in the heredity, in the genetic endowment of suceeding generations," he points out; " no understanding of evolution is possible except with the foundation of a knowledge of heredity." [104] With a slightly different emphasis, Sir Julian Huxley makes the same point with equal vehemence: " The discovery of the principle of natural selection *"-caveat lector –"* made evolution comprehensible; together with the discoveries of modern genetics, it has made all other explanations of evolution untenable." [105]

At the cost of getting a bit ahead of ourselves, let us note here quickly and parenthetically that " one thing no single mutation has done is to produce a new species, genus, or family. This is because species and supraspecific categories differ always in many genes, and hence arise by the summation of many mutational steps." [105a] (The objection that this view involves contradiction because it implies generation of a "higher" by a" lower" species [leaving aside for the moment the detail that species as such neither exist nor generate, save among the angels, if such there be, and even then there would still be no generation] will be disposed of in Section VIII below.)

Such, then, is the theoretical framework of contemporary evolutionary thought. I have called it a "quasi-syllogistic," and by this I wanted to call attention to and stress the logical

[103] Dobzhansky, *Genetics and the Origin of Species,* p. 88. Nor will it do here to say I am committing the error of settling properly philosophical questions by appeal to scientific fact in itself unrelated to the intelligible issue. It is for the philosopher to relate such facts to his own knowledge and principles, not to casually dismiss them as of no interest. In short, if the philosopher neglects the task of drawing out from the properly physical data of science an intelligible content which is in fact there to be *seen,* he has no one to blame but himself (even if he is not to blame: vessels of clay are not the best containers for the workings of understanding). See fn. 168 *infra.*

[10·] Dobzhansky, *The Biological Basis of Human Freedom,* pp. 10 and 11.

[10··] *EvolutiO'IIin Action,* p. 85.

[10···] Dobzhansky, *Genetics and the Origitn of Species,* p. 81.

rigor and structural interdependence with which the seven factors which are the foundation of the science hold together. It will be useful to diagram this structural interdependence to make sure the syllogistic analogy is clear. To do this, let us represent the sequence of facts and deductions as a progression of major and minor premises, in which the first two " premises " are empirical, and where each " deduction " becomes in turn a major premise to be coupled with an empirical minor premise to yield a further necessary step. Pictured thus, the materials we have just summarized exhibit the following pattern:

::\IAJOR: Reproductive Prodigality (1st Fact)
MINOR: Population Constancy (£nrl Fact)
CONCLUSION: Struggle For Existence (lst Deduction)

MAJOR: Struggle For Existence (1st Deduction)
MINOR: Appreciable Variation (3rd Fact)
CONCLUSION: Differential Elimination/Survival

-D-iff-e-re-nt-ia_l_S-ur-vi-.v-al-(£-nd-D-ed-u-ct-io-n)-

MINOR: Particulate Inheritance (4th Fact)
CONCLUSION: Evolutionary Selection (Srd Deduction)

Here, then, the full philosophical weight of contemporary evolutionary biology makes itself felt. We are in confrontation with a *phenomenon of necessity* giving to nature as a totality a depth-dimension, that is, a radically developmental structuring made secure by the very tendency to both endure (*agere sequitur esse)* and stamp the environment with its image (*agens facit simile sibi)* which characterizes the existence of each individual entity regarded, as it were, in isolation.

Such at least must be our conclusion if we may take as a criterion of unqualified knowledge the following text from Aristotle:

'Ve suppose ourselves to possess unqualified scientific knowledge of a thing, as opposed to knowing it in the accidental way in which the sophist knows, when we think that we know the cause on which the fact depends, as the cause of that fact and of no other, and, further, that the fact could not be other than it is. Now that scientific knowing is something of this sort is evident-witness those who falsely claim it and those who actually possess it, since the former merely imagine themselves to be, while the latter are also actually, in the condition described. Consequently the object of unqualified knowledge cannot be other than it is.[106]

Thus Dobzhansky, writing on the character of evolutionary selection, could remark almost syllogistically:

[Major:] Its ironclad necessity was clearly expressed by Darwin in an argument that can be reduced to a few sentences. Any organism needs food in order to live; the resources are always limited; the number of individuals of any species is therefore also limited. Any species is capable of increasing in number in a geometric progression; sooner or later the state will be reached when only a part of the progeny will be able to survive. *[Minor:]* The statistical probability of survival or elimination, despite accidents, will depend on the degree of the adaptedness of individuals and groups to the environment in which they live. This degree of adaptedness is in part conditioned by the genetic endowment. *[Conclusion:]* Therefore, carriers of some genotypes will survive, or will be eliminated, more or less frequently than will the carriers of other genotypes, and the succeeding generations will not be descended equally from all the genotypes in the preceding generations, but relatively more from the better adapted ones. Therefore, the incidence of better adapted forms will tend to increase and the incidence of the less well adapted ones to decrease.[107]

At the strictly biological level and throughout the living community, *developmental succession in transcendental relation to environmental succession* is a necessary phenomenon. In this

[106] Aristotle, *Analytica Posteriora,* Bk. I, ch. 2, 71 b 8-15.
[107] Dobzhansky, *Mankind Evolving,* p. 128.

we possess a key insight into the fundamental structure of the world/ [08] Bergson writes:

There is no doubt that life as a whole is an evolution, that is, an unceasing transformation. But life can progress only by means of the living, which are its depositaries. Innumerable living beings, almost alike, have to repeat each other in space and in time for the novelty they are working out to grow and mature. It is like a book that advances toward a new edition by going through thousands of reprints with thousands of copies. There is, however, this difference between the two cases, that the successive impressions are identical, as well as the simultaneous copies of the same impression, whereas representatives of one and the same species are never entirely the same, either in different points of space or at different moments of time.[109]

From every point of view, the balance of life is struck so subtly within the very being of every living creature that it is difficult to realize how intimately each life is connected with a great many other lives. Perhaps this is why the idea of evolution is dealt with so reluctantly by many thinkers, and why an understanding of heredity can make all the difference in one's philosophical attitude toward the evolutionary problematic. In any event, it can be said that, once the genetic basis of evolutionary problems is clearly understood, one sees how logical evolutionary events really are; and that traditional scholastic thought was seriously mistaken in its tendency to regard all deviations from the parental pattern as strictly accidental in the sense of not entering into the organism's fundamental de-

[108] Traditionally, in terms of the convertibility of the act of being with unity, a set of " transcendental " notions have been worked out which are " nothing but being itself explicitated in a certain way" (Ralph A. Powell, *Truth or Absolute Nothing,* River Forest, Ill.: Aquinas Institute, 1958, p. fl6). Here, I am suggesting that, having recognized that "all things are either one or many, and of the many each is one" (Aristotle, *Metaphysica,* Bk. III, ch. 4, 1001 b 6), but now in light of the distinctively modern discovery that all natural units are transformable, i. e., that there are no praeter-lunar regions exempt from radical transformations, it is possible to work out evolution as a transcendental of the interaction situation, i.e., a transcendental convertible with being not as a unity, but as a plurality. It is the " *esse* " consequent on the *interagere* of beings.

[109] Henri Bergson, *Creative .Evolution,* authorized trans. by Arthur Mitchell <New York: Modern Library, 1944), p. *fl52.*

velopmental process nor consequently into its " essential definition."

Let us therefore consider in the framework of evolutionary science the role and structure of species in an evolving world, preparatory to an attempt to illumine those very notions in terms of the principles of traditional philosophy.

V. SPECIFIC STRUCTUREs IN AN EvoLVING WoRLD

In another work,[110] I have attempted to show that, with the exception of a tendency to typological thinking, in the sense of reification of ideal notions of natural kinds (which, so far as Aristotelianism was concerned, by right should have been abandoned with the unchanging heavens that were its mainstay, but which so far as Platonism was concerned rested on an ambition to substitute the constructivistically explanatory mode of reason in its noblest or mathematical form for the properly philosophical or natural physical mode of explanation which discriminates reasons for being in the very order of experience), the key sources of reasoned opposition to the evolution of nature did not draw on the thought of classical antiquity or on the scholasticism which extended it into medieval times. The chief obstacles to the reasoned development of evolutionary evidence stemmed in every case from what has been well described as " the nationalistic atmosphere of the seventeenth and eighteenth centuries which was impatient of distinctions between different types of knowledge," [111] and in general even more from the scientific than from the religious temper of that modern Age of Enlightenment, inasmuch as it was the former and not the latter which was the source of the conviction that not just astronomy or physics but any study, be it "a work of ethics, politics, criticism, or even eloquence, other things being equal, is merely so much more beautiful and perfect if it is written in the geometric spirit." [112]

[110] See Part I of Nagar's and Deely's *The Problem of Evolution.*

[111] Benedict M. Ashley, "Aristotle's Sluggish Earth, Part II: Media of Demonstration," *The New ScholasticiMn* (April, 1958), p. 284.

[119] Fontenelle, Preface to *On the Usefulness of Mathematics and Physics;* quoted

Thus Loren Eiseley has pointed out that " variation, selection, the struggle for existence were all known before Darwin. They were seen, however, within the context of a different world view." [113] Thus "it was not natural selection that was born in 1859, as the world believes. Instead it was natural selection without balance," [114] i.e., a vision of the world-order as being in a dynamic, relative equilibrium rather than a permanent and mechanical one.

From a philosophical standpoint, this amounted to a returning to Aristotle's epigenetic view of individual development m

in E. Cassirer, *The Mind of the Enlightenment* (Princeton: The University Press, 1951)' p. 16.

[113] Loren Eiseley, *The Fi1·mament of Time* (New York: Atheneum, p.

[1"] *Ibid.,* p. 81.

[115] Mayr points out *(Animal Species and Evolution,* p. 4) that "more important for the development of the synthetic theory than the rejection of ill-founded 8pecial theories of evolution was the rejection of two basic philosophical concepts that were formerly widespread if not universally held: preformism and typological thinking." We have already indicated the very different bases of typological thinking in Mayr's sense in the philosophy of Aristotle and that of Plato, it being in the former case a function of the conception of the heavens as unchanging and in the latter case a function of the conception of the forms of nature as transcendent to nature itself. (See fn. 154 *infra.)*

So far as the philosophical concept of preformism is concerned, it is a concept which never played a role in Aristotle's conception of individual development. This is an historical note of some importance: " Long before the materials of generation were known in any physiological detail, two dominant theories of development dominated the thought of biologists and naturalists. Hippocrates (460-377 B. C.), over two thousand years ago, suggested that in generation the semen came from all parts of the body and that all the parts produced pangenes or particles representing each part. Each part was preformed to be what it became in the adult offspring. This was called the theory of pangenesis and theories like this were known as preformistic theories of development. In this way, Hippocrates hoped to explain both the replication of type and the obvious variations.

" *Aristotle,* in turn, *rejected* the theory of pangenes and the idea of *preformism in reproduction.* Still without accurate materials for an exploration of this problem, he reasoned that since the semen cannot have the same character as the parts from which they come, the process of reproduction must involve a true ' creative' process of unfolding what is only potentially there from the parent. Holding that the whole organism is greater than any of its parts, he reasoned that the best way to explain both the repetition of type and the production of novelty was to recognize the potential factor in the reproductive material and regard the developmental process as the progressive eduction or actualization of adult form. This

minus " the features of Aristotelianism which were the survival of mechanism and mathematicism in his view of the world " and which were his patrimony as a student of the Academy; [116] minus, that is to say, the unchanging environmental reference of the celestial, immutable spheres which were (as *causa regitiva)* the sole guarantee that the relation of generator-generated would be absolute and not just relative across the ages.

That is why, if one keeps to a philosophical standpoint the history of which is transparent to itself, since Darwin neither inaugurated a new logic of scientific questions nor freed in principle the phenomena of life for the possibility of transition (the astronomers had done that), but simply attempted to indicate the network of causes which made transition necessary, it is simply naive to assert that " the influence of Darwin upon philosophy resides in his having conquered the phenomena of life for the principle of transition, and thereby freed the new logic for application to mind and morals and life"; [117] the influence of Darwin on philosophy resides rather in a return to the conception of science as reasoned facts, distinct from and superordinate to mathematized facts.

When one turns to an assessment of specific structures in an evolving world and seeks to gather the lines of evidence bearing on their reality and role, it is important to be absolutely clear on the real nature of the Darwinian revolution as a renewed attempt to seek out proper causes, or as a reestablishment of " the independence of explanation and prediction," [118] in a

unfolding of organic development became known as epigenesis. It is interesting to note that during the entire history of biology, experts have been divided between the theory of epigenesis and the theory of preformation. Darwin, in his Origin of Species, revived a theory of pangenes very similar to that of Hippocrates." (Raymond J. Nogar "Preformism vs. Epigenesis" in *The Wwdom of Evoluticm,* p. 292. For a presentation of the history of this question, see E. S. Russell, *The Interpretation of Development and Heredity,* London: Oxford, 1930, esp. ch. III).

[116] Ashley, "Change and Process." See fn. 87 above.

[111] John Dewey, "The Influence of Darwinism on Philosophy," pp. 8-9.

[118] Ernst Mayr, "Cause and Effect in Biology," *Science,* 134 (November 10, 1961), p. 1504. See also Michael Scriven, "Explanation and Prediction in Evolutionary Theory," *Science,* 130 (28 August 1959), pp. 477-482.

period convinced by its distinctive contributions to knowledge that geometry provided the only entry into philosophy.

Thus a recent author aptly points out:

> Much of the sound and fury surrounding evolutionary theory is due to a misapprehension of sorts. Evolution initially had no pretensions to the status of a *Weltanschauung,* nor did it seek to serve as a substitute for the Christian doctrine of creation. . . . The theory of evolution actually grew out of a conflict between *two distinct and opposing biological theories.* It was a family quarrel. The dominant biological theory was that of a *fixed and immediate creation of species.* This of course has little or no reference to the theological doctrine of *creatio ex nihilo.* Nor is the concept of the fixity of species a logical deduction from the philosophical doctrine of the immutability of essence, although the genus and species of Linnaeus do carry some of the logical and conventional characteristics of the Aristotelian genera and species.[119]

Ultimately, of course, it is necessary to face this question of what relation *does* the stable or labile nature of species have with the philosophical doctrine of the immutability of essence: this is the whole question of the mutual import of the modern and traditional species problematics. Everything that has been said up to now moves in this direction and will be confirmed or infirmed depending on our success in articulating an answer.

But to attempt a delineation of that question would be fatuous if we do not first see what has been the outcome of this "family quarrel," and secure our understanding of the articulations of nature in terms thereof. On any other course, it is at best premature and at worst gratuitous to assert that" biological species from Linnaeus to the present have little in common with the philosophical species because they have no (philosophically speaking) specific differences but only accidental differences," [120] for "to say that wherever we have only nominal

[119] William E. Carlo, *Philosophy, Science and Knowledge* (Milwaukee: Bruce, 1967), p. 118. At the same time, it is necessary to add that, while agreeing completely with Dr. Carlo's historical point here, I must disagree almost equally completely with his general assessment of the evolutionary question (op. *cit.,* ch. VI, "Evolutionary Theory and Philosophy," pp.

[120] *Ibid.,* p. 120.

definitions the objects are not species, is to conclude from our ignorance to the nature of things." [121]

Our immediate question therefore must be: what is the metalogical status of real natural kinds, prescinding for the moment from the possible distinction of " radical " and " superficial " (in the senses we have already defined)? What is the status of our intuitive, "common-sense " conviction " that *there is* a diversity of species in the corporeal world, and that this diversity is manifested in the activity of bodies"? [122] For if our reasoning here is not to be circular and a begging of the question, " the issue concerning our knowledge cannot be resolved " (i. e., it is impossible to say in a founded fashion, for example, that" the philosopher knows in advance-! mean by purely philosophic means-that *there is* a diversity of species in the corporeal world " [123]) " unless there are extrinsic (ontological) criteria for judging whether what is known ... exists as an infima species. Hence, unless such extrinsic criteria can be found . . . neither the ontological nor the epistemological problem concerning species can be solved. One thing is clear: ... the nature of our knowledge, its relative perfection or imperfection, is no basis for inferring anything about the nature of things, so far as specific distinctions go." [124]

[121] Adler, *The Problem of Species,* p. 43.

[122] Jacques Maritain, "Foreword" to Adler's *The Problem of Species,* p. xi.

[123] *Ibid.*

[12·] Adler, *The Problem of Species,* p. 210. See fn. 16 *supra,* and references cited therein. Also St. Thomas, *Summa Theol.,* I, q. 76, a. 3 ad 4; and I, q. 85, a. 3 ad 4: " dicendum quod universale, secundum quod accipitur cum intentione universalitatis est quidem quodammodo principium cognoscendi, prout intentio universalitatis consequitur modum intelligendi qui est per abstractionem. Non autem est necesse quod omne quod est principium cognoscendi, sit principium essendi, ut Plato existimavit: cum quandoque cognoscamus causam per efl'ectum et substantiam per accidentia. Unde univcrsale sic acceptum, secundum sententiam Aristotelis, non est principium essendi, neque substantia, ut patet in VII Metaphysica" (ch. 13, 1038 b 8-16; lect. 13 of Aquinas's *Commentarium,* nn. 1570-76). To this must be added Adler's decisive demonstration that " the sign which tells us whether distinctions are accidental or essential " is the fact that, whenever a bifurcate division rests on a non-essential difference in a nature, " these two distinctions cannot be ordered *in a single way-this* fact shows that the distinctions are accidental." ("Solution of the Problem of Species," fn. 72 p. 337). See *The Problem of Species,* pp. 157-163,

" The question, in short, concerns the criteria by which we are able to select that one from a series of nominal definitions which signifies a species, a real essence." [123] " The method then that we must adopt is to attempt to recognize the natural groups, following the indications afforded by the instincts of mankind, which led them for instance to form the class of Birds and the class of Fishes, each of which groups combines a multitude of differentiae, and is not defined by a single one as in a dichotomy." [126]

If this is what we mean by knowledge "that there is a diversity of species in nature manifested by the activity of bodies "-and it seems to me we must at least and first of all mean this-then unless and until *this* sense of species as natural groups or kinds can be put on a causal (which is to say a minimally ontological) footing and elevated to the level of reasoned fact, there can be no possibility of *further* discriminating between "natural" species (as radical kinds) and "systematic" species (as superficial kinds) . For a distinction

for the full force of this proof; and at this point, it is necessary to insert a *caveat.* Dr. Adler's reflections on the problem of specific natures and the hierarchy of essences have been continuously sustained and developed over more than thirty years. In fact, they constitute the most profound contribution to the question yet made, but their very nature is such that *the early writings cannot be rightly understood unless taken together with the later, much briefer essays.* To judge Dr. Adler's position on the book *The Problem of Species* alone, therefore, would not only be a mistake, it would necessarily result in a serious misunderstanding. There are four essays which, in my opinion, must be taken as a unit, and it is necessary for the serious reader to accomplish for himself the interrelations and corrections that obtain among them. These four works are, in chronological order: *The Problem of Species;* " Solution of the Problem of Species "; " The Hierarchy of Essences"; and "The Philosophers Give All the Answers and Establish None," ch. 4 of *The Difference of Man and the Difference It Makes.* Toegther, these four constitute the necessary point of departure for philosophical work in this area, whether one accepts their conclusions or not. What Kant said of his own work on metaphysics in his *Prolegomena,* I say here of Adler's work on the philosophical problem of species: " He who undertakes to judge or, still more, to construct a theory of species and essential differences must satisfy the demands there made, either by adopting Adler's solution or by thoroughly refuting it and substituting another. To evade it is impossible." Cf. Immanuel Kant, *Prolegomena to Any Future Metaphysics* (New York: Library of Liberal Arts edition, 1950), p. 11.

[125] Adler, *The Problem of Species,* p. 37.

[126] Aristotle, *De partibus aninwlium,* Bk. I, ch. 3, 643 b 10-13.

which contributes no clarification to the issue being discussed is a useless and merely verbal distinction; and such is the case for anyone who asserts, on the one hand, that there are other natural species besides man, that there are species which have not only " accidental " differences accessible to " science " but also specific differences " philosophically speaking," yet, on the other hand, when pressed to defend his views concerning the reality of these " natural " as distinct from " systematic " groupings finds it impossible to illustrate his point with a single specific example.[127] "There is not only evasion here, but hopelessness."[128]

If we are concerned with rendering intelligible the articulations of the living world in rational terms, then, " we must not consider the diversity of natural things as proceeding from the various logical notions or intentions which flow from our manner of understanding, because reason can apprehend one and the same thing in various ways."[129]

The subjectivist is usually primarily concerned about the workability of his units and will set the limits of his species where the discontinuities corresponding to his criteria, which are usually external [i. e., epistemological], are most obvious to him. The believer in the reality of species, on the other hand, will strive ideally to find the achievements of nature in their integrity, i.e., the species as they really exist, and to prepare descriptions expressing these realities. In other words, while the subjectivist adapts nature to his concept of order and practicality, the realist makes an effort to adjust his concept, descriptions, and circumscriptions to the entities as they exist. Of the two outlooks, the latter is certainly to be preferred, if workable.[130]

[127] Adler, in " The Hierarchy of Essences," p. makes this point crushingly via the simple observation that, so far as induction is a process of inferring from observable particulars to generalization about kinds, whatever the kinds may be and whether the generalization is necessary and certain or contingent and probable, in every case " induction with respect to kinds can be viewed as a process of concluding from instances or particular evidences that a nominal definition is real or, in other words, *that the kind for which a definition can be notionally or verbally formulated really exists"* (my emphasis).

[128] Adler, *The Problem of Species,* p.

[129] Thomas Aquinas, *Summa Theol.,* I, q. 76, a. 8 ad 4.

[130] Jean R. Beaudry, "The Species Concept: Its Evolution and Present Status," *Revue Canadienne de Biologie,* 19 (September 1960), p. Beaudry goes on to add: " Nature, however, has evolved with an utter disregard of the practical

And it is workable if and to the extent that the reasons for the differences of the natural groups, the true and proper causes, can be assigned in the patient work of research. Such at least was the conviction of Aristotle: " The best course appears to be that we should follow the method already mentioned, and begin with the phenomena presented by each group of animals, and, when this is done, proceed afterwards to state the causes of those phenomena, and to deal with their evolution." [131] Such, too, is the conviction of evolutionary science, and it is striking that a survey of the definitions and statements concerning species made by the leading evolutionists today can conclude that " all of them imply the reality of species and entirely neglect the idea that it is only a construct of the human mind," [132] and that all of them are concerned with a causal account of this reality.

problems that would face its students, and it is sometimes found that its realities are so complex, elusive, or inconvenient that they canot be satisfactorily encompassed into the units of the systems which have been invented for the purposes of its study. If objectivity requires that these systems be adapted to nature, and not that nature be adapted to them, the limitations of our conceptual means, of our methods of graphic representation, of our systems of codification, impose boundaries to our quest for the ideal, beyond which confusion replaces order. Such appears to be the situation in taxonomy when we attempt to make a classification too highly phylogenetic, or to codify all the facets of the multifarious species. A compromise then has to be reached between the ideal and the workable. Realistic systems of classification and applied species concepts embody this idea, where necessary." In this connection, see R. J. Nogar, *The Wisdom of Evolution,* pp. 824-85. It should be noted that Dr. Nogar's remark on p. 882 that, with such an animal as the domestic cat, for example, " if the root reason for all the characteristics were known, a logical or dialectical definition with genus and specific difference "-proximate genus and essential difference in the traditional sense, he means- " could be assigned," is a remark not only contrary to the major thrust of his own analysis (and a remark inserted for the sake of an old teacher, I suspect), but a violation of the principle of parsimony. In fact, with *felix domestica* as with every other plant, animal, and human population, there is every reason to consider that the unifying intelligible reason for all morphological, physiological and ecological characteristics lies not in the organism as a distinguishable natural unity but in the *relation befJween* the organism and its proper environmental niche--if you like, in the " economic system " of the organism. (It is in this sense and this sense alone, moreover, that Darwinism can be regarded as having provided a " scientific base " for the Marxian ideology) .

[131] Aristotle, *De partibus animalium,* Bk. I, ch. 1, 640 a 14-16.

[132] Beaudry, *art. eit.,* p. 224.

It is perhaps even more striking that, in the end, the modern species problematic finds itself compelled, even as we shall see does the traditional problematic, to reject and abandon "the idea that species are always distinguishable by means of morphological or external characters." [133]

Striking and decisive parallels, no doubt, but not surprising ones: for both are linked to the common aim of rational understanding by a common logic and bounded, formally speaking, by a common set of problems. What their divergence is in this matter we shall finally see, but first we must follow the indications afforded by the instincts of mankind, which recognize a difference between elephants and oysters and seaweed and cactus as between natural groups or kinds; and recognizing these differences, see what can be said about their reasons for being. In the end, to see why there are natural kinds is to see what they are. Then we may ask if they further divide before the mind in some distinctively philosophical sense. What, then, in the present state of research, is the causal status of the natural articulations of nature?

At the outset of their work, but precisely because they were concerned from the first with the assignation of truly proper causes, evolutionists tended to confuse two essentially different problems-species transformation and species mutiplication-in a single concept. This confusion was even written into the title of Darwin's classic text, *The Origin of Species.*

Subsequent research made it clear, however, that the question of evolutionary change as such *(the transformation of species in time)* is fundamentally distinct from the question of the origin and multiplication of species as such. The essential aspect of species transformation is the continuous genetic and adaptive change within the population composing the species; while the essential note of species multiplication is the development of reproductive isolation (discontinuity) between populations of the species, i. e., the splitting up of an originally uniform species into several daughter species-the *multiplication of species in space.*

[133] *Ibid.,* p. 2::!6.

" The problem of the multiplication of species, then, is to explain how a natural population is divided into several that are reproductively isolated, or, more generally, how to explain the origin of a natural population that is reproductively isolated from pre-existing species." [184] This problem-like the" higher from lower forms " question which we shall address in Sec. VITI -resists resolution as long as one approaches it primarily in the non-dimensional terms of " formal perfection " univocally conceived and bridgeless discontinuity. Just as at the level of radical kinds, as we shall see, " evolution would be shocking only for a strictly Aristotelian conception of the causal process *reduced to the transmission of an identical* form--while the individual existence of the effect is overlooked," [135] so in a similar manner here at the level of natural kinds as yet undifferentiated further according to the possible categories of modes of real difference-superficial and radical-the typological impasse, the impasse consequent upon the insufficiently critical reification of cognitive intentions, is transcended as soon as it is reconceptualized in terms of the population structure of species. In both cases, the discourse is governed throughout by the analogous realization of the formal axiom, *causae sunt ad invicem causae.*

In its main lines, the view of species as interaction-structured populations is not hard to sketch, and it underpins causally the " instincts " of mankind which lead men to form the class of birds and the class of fishes, and so on.

As we have seen, the process of differential gene transmission is the key to the necessity of biological evolution, because it is the source and stable basis for the establishment of novel variations. When variation reaches the threshold of specific discontinuity in the evolution of a given life form, however, the intervention of so-called isolating mechanisms, " the evolutionary devices for preventing interbreeding between closely related and formerly united populations," [136] must usually intervene in

'"' Mayr, *Animal Species and Evolution,* p. 481.

[185] Joseph de Finance, *Existence et Liberte* (Paris: Vitte, 1955), p. !l68.

[186] Simpson, *The Meaning of Evolution,* p. 288.

the process of differential gene transmission if the threshold is to be actually crossed. Basically, this amounts to saying that some degree of spatial isolation is ordinarily prerequisite *(requisitum ut in pluribus)* to species formation. Dobzhansky succinctly comments: "It is the geographic separation of races which prevents them from crossing and exchanging genes at rates which would result in fusion of these races into a single variable population. . . . Yet as races diverge more and more, they become adapted to different environments in their respective territories or to the different modes of life," until finally behavioral and psychological traits are established which (sometimes along with anatomical configurations) serve to insure against free gene exchange even should the geographical barriers between the distinct populations be in one way or another removed.[137]

In other words, the real problem in attempting to experimentally and causally ground our insight into the metalogical status of natural kinds in an evolutionary world, into the process of speciation, becomes one of determining (relative to reproductive activity between genetically consonant groups) the threshold of behavioral disparity which will effectively sustain the variance of gene frequencies in the respective gene pools: it is not a question of an absolute, formal discretion, but rather of a sometimes ambiguous behavioral frontier.[138]

[137] Dobzhansky, *Evolution, Genetics, and Man* (New York: John Wiley & Sons, Science Editions, 1963), pp. 183-4. Cf. *Genetics and the Origin of Species;* pp. 205 and 255: "The real problem is how much gene exchange between the diverging populations is possible without arresting and reversing the divergence." "The patterns with superior adaptive values form the 'adaptive peaks'; the peaks are separated by the 'adaptive valleys' which symbolize the gene combinations that are unfit for survival and perpetuation. The reproductive isolating mechanisms, as well as the geographic isolation, interdict promiscuous formation of the gene combinations corresponding to the adaptive valleys, and keep the existing genotypes more or less limited to the existing peaks. The observed discontinuity in the body structures and in the ways of life is a result of adaptation to the discontinuity of the secular environments on our planet."

[138] Cf. Mayr, *Animal Species and Evolution,* p. 523: "The range of a species is delimited by a line beyond which the selective factors of the environment prevent successful reproduction. This line is called the species border. Single individuals mv,y appear annually in considerable number beyond this line, yet fail to

Contextualizing these considerations within the general framework of the basic theory established by contemporary evolutionary science, we may say:

A mutation produces discrete differences and to this extent its appearance [like that of an individual organism as such] is an instantaneous and discontinuous evolutionary event, whether its effects be small or large. But it is populations, not individuals, that evolve. For a given mutation, regardless of its " size" [i. e., visible morphological impact] to become involved in the origin of a new and especially of a highly distinctive group of animals it must spread through a population and while doing so and thereafter it must become integrated in a new sort of genetic system.[189] It is very nearly impossible to imagine these processes occurring except by transition over a long sequence of generations, and certainly no conclusive, or even really suggestive, opposite example is provided by the paleontological record.[140]

establish themselves permanently. Even if they succeed in founding new colonies, these are sooner of later eliminated in an adverse season. As a result, the species border, though fluctuating back and forth, remains a dynamically stable line," i. e., so long as the environment does not suffer fundamental change.

139 Thus Dobzhansky comments *(Evolution, Genetics, and Man,* pp. 147 and 177): " What natural selection does is to establish proportions of the genotypes at which the average fitness of an individual in the population is the highest attainable one, but the high fitness of the population as a whole is purchased at the price of producing some genetically unfit individuals (the homozygotes)." " The gene pool of a sexual population comes, therefore, to consist of genes that are *coadapted,* that is, that fit well together when present in heterozygous individuals. . . . The process of coadaptation makes a species something more than a collection of individuals." Simpson himself adds at this point in his text the following footnote: "This special aspect of evolution is expertly treated in C. D. Darlington, *The Evolution of Genetic Systems* (Cambridge, England: The University Press, 1989). See also C. H. Waddington, *An Introduction to Modern Genetics* (New York: Macmillan, 1989); and his "Evolution of Developmental Systems" *(Nature,* [147] 1941)' 108-110."

uo Simpson, *The Meaning of Evolution,* pp. 288-4. Simpson's descriptive analysis of the physical causality involved and the conclusion to which it leads him (namely, that " it is very nearly impossible to imagine these processes [effecting speciation] occurring except by transition over a long sequence of generations ") receives *prima facie* reinforcement in W. H. Kane's metaphysical analysis of " Existence and Causality ": " A cause which is limited in being can produce something similar to itself, but not something diverse, and so it cannot produce an effect distinct from itself as such, that is, as distinct." The reason is that " secondary causes do not produce the whole effect and all that is in it, but always presuppose something, and then produce as their proper effects, not exist-

Thus, " with the aid of isolating mechanisms, natural selection directs and guides the variety away from the parent stock and on to the development of new forms of life." [141] It is necessary to keep clearly in mind in this case, as in every case of causal analysis, that the principles of explanation do not lie at a simply visual level but in the order of reason. In terms of the proper causes involved in this question of the existential articulations of nature, " visible characters, and especially the macroscopic ones, will always be the most convenient ... but where nonexistent or poorly developed, the invisible or less convenient should be resorted to, because the species exist whether visibly expressed or not," and "the essential sets of genes which constitute the species cannot be seen." [142]

ence as such, but other perfections which limit and determine existence." " Hence an agent which is limited and determined with respect to genus, species, and accident has limited power determined to effects which are similar to itself as the agent, and it acts to produce something similar to itself." *(The Thomist,* XXVIII [Jan., 1964], pp. 90 and 89.) William C. Boyd provides in effect an empiriological formulation of these abstract considerations in application to the concrete evolutionary data in his consideration of "The Contributions of Genetics to Anthropology ": **"It** is true that we now think of evolution as resulting from the action of selection on genetic mutations. But this does not mean that there are no limits to what the mechanism can accomplish. The genes of any animal that survives and competes successfully with its fellows in the struggle for existence must be reasonably harmonious with one another, for anything else is not compatible with the continued existence and reproduction of the animal. Each creature is like its ancestors in all but a few respects. The differences which have arisen must necessarily coexist in harmony with the more extensive, more complex elements which are not different. Each character is dependent on the interaction of many genes, so that it will be easier to continue a line of evolutionary change for which many of the modifiers are already present [orthoselection] than to start off on an entirely new line. Species are not constructed *de novo,* but on the basis of genotypes already existing. In most cases no sort of modification which is within the capabilities of the existing genes and possible mutations would be definitely advantageous, and in many other eases only one particular modification would be an advantage." (In *Anthropology Today,* Sol Tax, ed. [Chicago: the University of Chicago Press, 1962], p. 66). Thus the adaptive flexibility and evolutionary advance observed at the level of the population is only possible by reason of the structural stability and limited adaptive range of the individual organism as such. Cf. Raymond J. Nogar, "Evolution: Scientific and Philosophical Dimensions," pp. !'lS-66, esp. p. 58.

[141] Nogar, *The Wisdom of Evolution,* p. 90.

[142] Beaudry, *art. cit.,* pp. 235 and 234, respectively.

A large fraction of the difficulties experienced with many modern definitions of species reside in the fact that these definitions insist not on the essence of species but on their limits with other species. As implied above, a definition based on essence automatically sets up limits which stem from within, whereas one based on limits or barriers with other species, which are at least partly extrinsic, does not necessarily suppose identity of essence. The essence of the process of speciation is thus not the development of reproductive isolation, but the development of a different genetical identity within a group. The development of this genetical identity necessitates isolation which, however, may primarily be spatial, i.e., geographical. But a segment of a population isolated by distance does not, because of that, become a distinct species. It only becomes so when it has developed its different essential genetical identity, suddenly or gradually. When this takes place suddenly ([as sometimes in plants] through polyploidy), reproductive isolation often accompanies it, but it is doubtful that it should *always* do so.[143]

Mayr summarized the status of research on the metalogical character of natural kinds by referring to them as the causal keystone of the evolutionary process, even as natural selection is the conceptual keystone of evolutionary explanation:

The evolutionary significance of species is now quite clear. Although the evolutionist may speak of broad phenomena, such as trends, adaptations, specializations, and regressions, they are really not separable from the progression of entities that display these trends, the species. The species are the real units of evolution, as the temporary incarnation of harmonious, well-integrated gene-complexes. And speciation, the production of new gene complexes capable of ecological shifts, is the method by which evolution advances. Without speciation there would be no diversification of the organic world, no adaptive radiation, and very little evolutionary progress. The species, then, is the keystone of evolution.[144]

We shall see in Section VII that this means that *hierarchization is an ontological characteristic of evolutionary advance,* therefore establishing the temporal prerequisite and structural

[148] *Ibid.,* p. 227.

[1]. Mayr, *Animal Species and Evolution,* p. 621. See also *ibid.,* "The Role of Species," pp. 422-3; and "The Species as a Potential Evolutionary Pioneer," pp. 587-588.

preconditions for the emergence of man, as well as providing the clue to the problem of choosing for non-subjective reasons a criterion of evolutionary progress; but it is just at that juncture that the primary concerns of modern biology meet those of traditional philosophy in the question of species, and we shall have to deal at that point with the problem of the two hierarchies, one imperfect, one perfect (in the senses already defined in Sec. I above), in their existential interarticulation.

What focusses our immediate attention is Dobzhansky's critical remark to the effect that "modern systematics has vindicated the intuitive conviction which workers in this field always had, and which was expressed concisely by Bateson (19!2!2): 'Though we cannot strictly define species, they yet have properties which varieties have not, ... and *the distinct-ion is not merely one of degree.*'" [145]

[145] Dobzhansky, *Genetics and the Origin of Species,* p. 259, my emphasis. " Although individuals, limited in existence to only a short interval of time, are the prime reality with which a biologist is confronted, a more intimate acquaintance with the living world discloses a fact almost as striking as the diversity itself. This is the discontinuity of the variation among organisms. If we assemble as many individuals at a given time as we can, we notice at once that the observed variation does not form any kind of continuous distribution. Instead, a multitude of separate, discrete, distributions are found. The living world is not a single array in which any two variants are connected by unbroken series of intergrades, but an array of more or less distinctly separate arrays, intermediates between which are absent or at least rare. Each array is a cluster of individuals which possess some common characteristics. Small clusters are grouped together into larger secondary ones, these into still larger ones, and so on in an hierarchical order." (Dobzhansky. *Genetics and the Origin of Species,* p. 4) . " Formation of discrete groups is so nearly universal that it must be regarded as a fundamental characteristic of organic diversity." *(Ibid.,* p. 6.) "Scientifically considered," therefore, in every dimension of the living world, " the similarities and the differences are incommensurable. Both have to be studied. It is folly to neglect either." *(Mankind Evolving,* p. 219) " Hence, the living world is not a formless mass of randomly combining genes and traits, but a great array of families of related gene combinations, which are clustered on a large but finite number of adaptive peaks. Each living species may be thought of as occupying one of the available peaks in the field of gene combinations. The adaptive valleys are deserted and empty." *(Genetics and the Origin of Species,* pp. 9 f.) " Biologists have exploited the discontinuity of variation to devise a scientific classification of organisms. The hierarchical nature of the observed discontinuity evidently lends itself admirably to this purpose. For the sake of convenience the discrete clusters are designated races, species, genera, families, and so forth. The classification thus arrived at is to some extent an artificial one,

It is interesting in this regard to contrast the conclusions of those quintessentially" modern" philosophers who have indeed broken with the Aristotelian pattern of questions and substituted in their place a new set of problems centered on the universe of discourse rather than the universe of being. Those thinkers who really seek to inaugurate a new type of questioning based on a new type of logic, as Dewey wrongly thought of Darwin as having done, arrive at a very different assessment of the status of natural kinds than does the causal assessment typical of traditional and contemporary approaches alike. Anthony Quinton, Fellow of New College and University Lecturer in Philosophy at Oxford, may be cited as an archetypical case of a ' philosopher ' who got off at the celebrated " linguistic tum ":

> The devices with which we classify the objects of experience are influenced in their formation by our interests as well as by the intrinsic nature of the things themselves. Thus a difference in kind in the natural order reflects only a dissimiliarity that is definite and interesting enough to lead us to invent a special word to mark it with ... such a difference could be said to rest on the solidity with which the conceptual distinctions we have chosen to introduce are entrenched in our way of thinking about the world. Natural differences in kind can still be important, even if they are all, in Adler's sense, no more than apparent [i.e., differences of degree].[146]

In the language of Beaudry, this is unquestionably the subjectivist outlook, which differs from the realist outlook in its

because it is a matter of convenience and convention which cluster is to be designated a genus, family, or order. But the clusters themselves, and the discontinuities observed between them, are not, as sometimes contended, abstractions or inventions of the classifier." *(Ibid.,* p. 5) "It must be stressed that this discontinuity [in the living world] exists regardless of whether it is or is not used by the systematists for their purposes, and for that matter whether it is studied at all. The discontinuity, the absence of immense multitudes of potentially possible gene combinations, is an objectively ascertainable fact." *(Ibid.,* p. 255.) " The hierarchic nature of biological classification reflects the objectively ascertainable discontinuity of adaptive niches, in other words the discontinuity of ways and means by which organisms that inhabit the world derive their livelihood from the environment." *(Ibid.,* p. 10)

""Anthony Quinton, "Mortimer Adler's Machine," *New YOTk Review of Books,* XI (Ill November 1968), p. 4. See references to Waddington's criticism of the linguistic approach to nature in fn. 148 below.

indifference to the logic involved in the process of determining whether two things differ in degree or kind, and to the wealth of empirical evidence that is now available to decide how natural kinds stand in their intrinsic nature prior to and independently of our personal and psychological interests. By contrast, Beaudry's "realist" considers that our affirmation of real and not just seeming differences in kind in the natural order rests today principally on the intrinsic nature of the things themselves, by virtue of the fact that " the development of genetical and evolutionary principles has permitted the study of individuals and populations not only by means of their external characters, and their distribution in space and time, but also through their internal organization and the dynamics of their interrelationships." [147]

There is no doubt that the species is something objective, that it is constituted by a substance incorporated in a mass. The existence of many such specific substances has been abundantly revealed by genetic studies. . . . The masses formed by these substances are not unitary entities but collective ones. . . . The distinctness of the individuals does not destroy the reality of the mass, since the individuals are not independent but are all interrelated in space and in time by physical links, in the form of gametes, which transmit the essential sets of genes to the distinct parts. The existence of a multiplicity of these different essential sets of genes is expressed through different integrated groups of external and internal characters, which are often sharply discontinuous but not completely so. The sophisticated arguments of various kinds of philosophers cannot hold when confronted with the impressive bodies of data collected by hundreds of experimentalists, about the reality of species, and summarized in books such as those of Clausen (1951), Clausen, Keck, and Hiesey (1940, 1945, 1948), Clausen and Hiesey (1958), Cuenot (1936, 1951), Dobzhansky (1951), Huxley (1942), Mayr (1942), Simpson (1944), Stebbins (1950), and many others. [148]

[147] Beaudry, *art. cit.*, pp.

[148] *Ibid.*, p. "'fhe idea that species are always distinguishable by means of morphological or external characters has had to be rejected. Different basic sets of genes can originate without accompanying visible manifestations." (p. One may be permitted to marvel at Mr. Quinton's unflinching readiness to entrench genetic orgins " in our way of thinking about the world "-after all, are not genes

From the standpoint of explanation by proper causes, then, there are three stages or levels in the evolutionary process and establishment of species: the origin of genetic diversity constitutes the *first level;* once arisen, the mutations are scattered throughout the population-they enter its gene pool, where they come under influence of selection, migration, and geographical isolation, thus establishing the *second level* of the evolutionary speciation process, where the impact of environment effects the historical changes in the living populations; finally a *third level* is reached when the sustained operation of isolating mechanisms achieves a relative fixation of the diversity cummulatively attained on the preceding two levels, so that a stabilization through a new genetic equilibrium is effected both within and among the evolving groups.

The essential feature of the *process of speciation,* " of the transformation of races into species, is, then, the development of reproductive isolation between Mendelian populations"; [149] while the essence of the *species itself* " resides in the common, basic genetic endowment of its members, which is always expressed in interbreeding, actual or potential." [150] In this way, a species constitutes a group unity structured intrinsically through interaction, that is, a *concrete universal.* " The species can thus be succinctly defined as follows: it is a community of

words? What Waddington refers to as "the inadequacy of the fashionable method of linguistic analysis " in respect of the problems presented by living things may be found spelled out in chs. 3-7 of *The Ethical Animal,* pp. 34-71, esp. ch. 4, pp. 46-9. (The quoted remark is from p. 83.) Moreover, Dr. Waddington's familiarity not only with the doctrines of both Logical Positivism and Linguistic Analysis but also with many of the key personalities expounding those doctrines (he was a personal friend of Wittgenstein, for example--see esp. " Squaring the Vienna Circle," ch. 3 of *The Ethical Animal,* pp. 34-45), makes his conclusions from the standpoint of an evolutionary biologist all the more interesting for the philosopher. The linguist, of course, need not be bothered with what pertains to the universe of being in its intrinsic determinations--until, of course, they happen to become " entrenched in our way of thinking about the world." Then we may be assured that Quinton *et al.,* like those other "scholarly men" mentioned by Kant *(Prolegomena, ed. cit.,* p. 3), will be on hand " to inform the world of what has been done."

[149] Dobzhansky, *Evolution, Genetics, and Man,* p. 184.

[150] Beaudry, *art. cit.,* p. 232.

individuals possessing common essential sets of genes, and actually or potentially related [proximally] through interbreeding." [151]

Dobzhansky goes so far as to conclude that " it is, then, not a paradox to say that if some one should succeed in inventing a universally applicable, static definition of species, he would cast serious doubts on the validity of the theory of evolution " [152]-which introduces us to our pivotal consideration.

[151] *Ibid.* Mayr *(Animal Species and Evolution,* pp. 27-9) points out "The Difficulties Posed by Asexuality " and which have led some authors to go " so far as to abandon the biological [i. e., genetic] species concept altogether and return to the morphological species for sexual and asexual organisms," but sums up by pointing out further that " the advantages of the biological species concept are far greater than its shortcomings. Difficulties are rather infrequent in most groups of animals and are well circumscribed where they do occur .... Indeed, the biological species concept, even where it has to be based on inference, nearly always permits the delimitation of a sounder taxonomic species than does the morphological concept." See also Beaudry's remarks on " Self-fertilization, Apomixis, and the Species," pp. 232-3. Finally, it should be mentioned that, as Stebbins in particular has pointed out (G. L. Stebbins, *Variation and Evolution in Plants,* New York: Columbia, 1950, esp. pp. 189-90), in the framework of the basic genetic view several different species definitions--whether in terms of ecology, geography, even morphology-remain legitimate and possible. As Maritain remarks in quite another context *(The Degrees of KnowledgB,* p. 200), "the capacity of a doctrine to integrate whatever is positive in systems which invoke different principles might perhaps be taken as an indication of its truth."

••• Dobzhansky, *Evolution, Genetics, and Man,* p. 182. Thus we are able (by clearing away the mists of metaphor) to correct and verify a philosophic no less than scientific insight formulated by Bergson relative to the evolutionary question in an initial-if not altogether satisfactory-manner as early as 1907, namely, the intrinsic natural necessity for continual causal play throughout a natural developmental process (cf. *Creative Evolution,* pp. 33 f. and 252). With customary clarity, Dobzhansky *(Genetics and the Origin of Species,* p. 17, *inter alia)* cuts through ambiguities in this matter: " Methods of experimental genetics apply directly only to forms which can be crossed and which produce hybrids. Genetic analysis is, accordingly, limited to differences on the individual, racial, specific, and at most generic levels, which are usually regarded as the province of microevolution. A geneticist can approach macroevolutionary phenomena only by inference from the known microevolutionary ones. It is obviously impossible to reproduce in the laboratory the evolution of, for example, the horse tribe, or for that matter of the genus [of fruit fly] *Drosophila.* All that is possible is to examine the evidence bearing on macroevolution which has been accumulated by paleontologists and morphologists, and to attempt to decide whether it agrees with the hypothesis that all evolutionary changes are compounded of microevolutionary ones. This difficult but

Can this genetic and authentically causal conception of specific structures be assimilated and expressed in terms of the essential principles of traditional ontology, or is it contrarily related to their texture and sense?

JOHN N. DEELY

University of Ottawa
Ottawa, Canada

(to be concluded)

important task has been brilliantly accomplished in recent years by Simpson (1949) for paleontological and by Schmalhausen (1949) and Rensch (1947) for comparative anatomical and embryological evidence. The three authors find nothing in the known macroevolutionary phenomena that would require other than the known genetic principles for causal explanation. The words 'macroevolution' and ' microevolution ' are relative terms, and have only descriptive meaning; they imply no difference in the underlying causal agencies." For a detailed and interdisciplinary report on the research in this connection, cf. Glen L. Jepsen, George Gaylord Simpson, and Ernst Mayr, eds., *Genetics, Paleontology, and Evolution* (New York: Atheneum Books, 1968). The most important single work covering this matter is, however, George Gaylord Simpson's masterful *The Major Features of Evolution,* which has in 1965 gone through its fourth printing. Naturally, there are informed pockets of opinion which simply reject the majority view, even though in this case the majority is near-unanimity and the dissenting minority can point to no known processes at work in the world of life other than those detailed and accounted for by the proponents of the 'synthetic' theory. A most recent exposition of the arguments for dissent, such as they are, can be found in Emile Guyenot's *The Origin of Species* (New York: Walker and Company, 1964). This author concedes a microevolution continually operative among races and even species, but, finding no direct proof for " evolution in depth " which involves modifications of genera, families, etc., he rejects the synthetic view. The intervening variable of geologic time which is necessary for large scale evolution obviously counts for little in the interpretation of such thinkers as this. Yet the fact remains that " with respect to the evolution which has actually taken place in the history of the earth, an observer of only the now-living animals and plants is still in a position of judging a long movie film by only the last picture frame." (Dobzhansky, *Evolution, Genetics and Man,* p. See fn. 66 above.

DIVINE NECESSITY AND CONTINGENCY: A NOTE ON R. W. HEPBURN

DEATH-OF-GOD theology has probably run its course as a phenomenon capable of generating popular interest.[1] The questions it raised, however, may be another matter. A theology that seeks to be pastoral will neglect this to its own detriment.

One of the most challenging studies of the God-question that has appeared on the American scene in a good while is a set of eleven essays written by Ronald W. Hepburn and entitled *Chri8tianity and Paradox.*[2] He proceeds under the assumption that theological discourse involves a critical exchange of views. An agnostic rather than an atheist, he has striven to make himself acquainted with the various types of justification that Christians offer for their theistic convictions. His own position of hesitancy is expressed as a reasoned alternative. Fruitful dialogue will not be initiated if silence is the sole reaction of believers to such a work. Neither God nor man is served that way. Furthermore, one is dealing with a serious and respectable treatment of the mystery that is at the heart of Christianity, that of the God whose good tidings the latter seeks to proclaim.

First Hepburn treats a number of approaches that lay claim to direct and immediate experience of God.[3] Then he turns his

[1] This is at least the way Paul Van Buren sizes it up; cf. *Theological Explorations* (New York: Macmillan, 1968), p. 6.

[2] Ronald W. Hepburn, *Christianity and Paradox* (New York: Pegasus, 1968). This book appeared originally in 1958 but is published for the first time in the United States with this edition. Its author contends, and rightly, that the interest in the God-question and religious language has surely not diminished in the meanwhile.

[3] *Ibid.,* He remains unconvinced when he studies the conviction of those who maintain that God can only be addressed and in no wise expressed. Of a theological audience that has grown accustomed to the Barthian distinction between *knowing God* and *kn01ving about God,* he asks incisively whether the two are not more complementary than antithetical.

attention to theistic evidences that take the form of demonstration or argument. To the latter a great deal of attention will have to be devoted by convinced theists, if they intend to enter into mutually profitable discussion with men of his calibre.[4]

God and Morality

It is his contention that secular ethics does not by any means exclude moral seriousness. In other words, a life of dedication to noble ideals does not depend on a morality that is theistic in its roots. A way of 1iving worthy of man does not, he argues, demand as its sole possible foundation the existence of God. In working out this conclusion, he introduces a number of ideas that could well serve as the basis for a further attempt to clarify the issue at stake.

He notes that few theologians today see moral principles as commands of God pure and simple. This means in practice that motivation seeks another source besides a divine imperative for a particular course of action. Goodness is the rational justification for obeying God; one obeys, even as a theist, because of a recognition that it is good to obey God's commands. Any other view, the reader is told, involves the worship of power as such.[5]

Obedience and its Motive

Here not a few believers would have to disagree or at least express reservations. For they find themselves faced ultimately not with the question whether one obeys God because it is good to do so but rather whether goodness does not consist precisely in obeying God. This may be misconstrued, of course. But there is no need denying that a good deal of Christian tradition, Protestant no less than Catholic, has seen goodness the result of divine commands. Does God will any created good

• There is no reason to think that the sole possible attitude the religious man can consistently take before the mystery of God is silence pure and simple. Even the assertion of His ineffability should bring this home, if the speaker will simply advert to what position he is taking when he says this and also what he is saying in taking that position.

• Hepburn, *op. cit.,* 129-80.

(e. g., the conformity of man's will to His wishes), because it is good, or is it rather a genuine finite good because He wills it and thus constitutes it as such? To such a disjunction Christians have reacted time and again by opting for the latter member. They have seen this involved in the acceptance of a God who does more than ontologically coexist with finite being, a God who exercises a real if respectful primacy in the Creator-creature relationship. Consequently, a creature that ponders a possible course of action may have trouble determining which of two alternatives is really the will of God. But if this is once established, for the theist there is no question of its goodness, as if the divine will had to be measured by some standard superior to God and man both.[6]

Perhaps this can be brought out more clearly in the following way. As far as the believing Christian or Jew is concerned, what does it mean to "praise the Lord for He is good"? For Hepburn it implies logically, to use his words, that God might have been bad and issued commands that should not have been obeyed at all. Otherwise, the reader learns, there would be nothing for man to be thankful about.[7] Again, the reason for obedience to God's commands must lie in neither omniscience nor omnipotence but rather in morally relevant features of the divine nature (e. g., goodness).

Evil, the Divine Will, and Theistic Presuppositions

Such reasoning may aim merely at showing that if a human being is to act reasonably in accepting a norm as divinely imposed, he must first be convinced that it is not totally arbitrary. This is, of course, undeniable. But Hepburn seems to mean a great deal more. And it is here that he points out, perhaps unwittingly, a difficulty in communication between Christian theists and agnostics. For a command that is really

• But that is precisely what Hepburn appears to ask of the believer: to justify obeying a divine command by showing that it squares with a norm to which one has recourse in determining what is good and which is, nevertheless, distinct from the divine reality itself.

• Hepburn, *op. cit.*, p. lSI.

wicked cannot emanate from God, as far as the former are concerned. If it is divine in origin, it is not wicked; if it is clearly and indisputably wicked, it is not divine. These remarks are not intended to establish the credibility of the believer's position. They aim rather at expressing one mental construct he generally excludes from the outset when discussing the God-question. He holds that there is no good reason for considering in this context a being who is superior to man but whose will may possibly be iniquitous and will always need explicit justification before man can morally follow it. Whether or not there is such a being is one thing. The theist sees no reason at all for bringing it up when the God-question is under direct study. For if such a being exists, one whose will is defectible in terms of good, for the theist a-priori that being is not God.

Now the agnostic may ask why the theist makes such an exclusion and what his warrant is for so doing. This could be a point of discussion between them. But to introduce such a being under the name of God will likely assure failure to achieve a direct confrontation on the same issue. For whatever else may be said of such an hypothesis, it does not refer to God for the theist. The latter may well be called on by the agnostic to explain why he excludes imperfection and moral evil from his God. That is another matter. But to expect him to discuss a God, indeed his God, as even the possible source of immoral edicts, that is to set up needless obstacles to communication from the start. The theist, if he is honest and intelligent, will have to understand that his confrere may wonder whether an unquestionably and indefectibly good being exists. But to speak of one otherwise qualified and yet designated as the Deity is simply to go outside the defining limits of the theistic hypothesis. Can justification be offered for setting the limits of the question as the theist does? I think so, but to do it is not called for in the present context. This is a question Hepburn does not pose, though he might well have done so. For then the central theological issue of the day (methodology) would enter even more explicitly into an evaluation of theism. In

short, a writer with difficulties regarding the validity of theistic evidences has to challenge the way his colleague uses the word *God* or else accept such a restriction. Otherwise, his arguments, however cogent, are somewhat beside the point.

Human Gratitude and Contingent Predications About God

Yet another issue on which productive dialogue with Hepburn might arise is his logic, which is in other contexts a real forte throughout his work. But, in dealing with goodness as related to the Deity, it seems to be deficient.

To say that God is worthy of praise because He is good does not necessarily imply that He might have been bad.[8] *Bad* is not the contradictory of *good.* Praiseworthiness of divine attitudes does indeed presuppose that they need not have been; that they are contingent. But does it imply that because of this they might have been just the opposite of what they are? May it not equally well be that God's ways are laudable because, although He is necessarily good in and for Himself, He chose freely to be good to and for others? For opting to be actually the Good-for-Others (even to the point of becoming the Man-for-Others?), would He not be worthy of man's grateful praise?

The motive for gratitude is in question, and believers are vitally interested as a result. Logically speaking, when one is grateful to another human being, the latter's goodness is the reason that evokes this attitude. But the question could arise: "Why should one be grateful just because another has been good?" The reply here has to be that the other person did what was more than he or she absolutely had to do. That party did what was good when there was no compulsion to do so. But does it follow that because one did what one did not have to do, one could have done the exact opposite? The fact of goodness deserves recognition. But does it always follow that one who does good in a particular circumstance could have done evil in that same circumstance? If he did the good freely, he could surely have failed to do it. But is every failure to

[8] *Ibid.*

do good therefore and automatically an evil? An affirmative reply needs more than assertion when human beings are in question. A concrete virtuous act in a person does not imply that the opposite vice was a real possibility under the same conditions. Nor does gratitude presuppose such a possibility. If this is true with men, can one suppose without a word of clarification that with God it must be otherwise? Even one who denies the existence of God or is an agnostic could see the sense in this observation: "If there is a God, man ought to be grateful to Him for being good even though as God He could never have been really bad." Within a theistic frame of reference (one that could be adopted hypothetically by the atheist to investigate the internal consistency in the position of theists), divine goodness toward others does not imply an unverified but nevertheless conceivable wickedness in God.

Perhaps a positive statement of this will help. After all, a dialogue is what is aimed at, and simply criticizing what one honestly considers defects in another's approach hardly suffices.

As a theist, I cannot see (and if others can, I hope they will point it out) any ground for asserting that an infinitely perfect God is or must be whatever it is objectively or logically possible for Him to be. The reason is that otherwise the simultaneous verification of contraries would be involved. He would, for example, have to be both Creator and Non-Creator. For if He is and is God, it is logically possible for Him to be either. Similarly, He would be perforce both benevolent and non-benevolent toward man. It may help to take the second set.

Why does non-benevolence reduce itself to malice? Could it not as well be a non-benevolence because there is no man at all? If one wishes to consider the absence of finite being (man included) , an evil, he would do well to state this and determine its meaning. In what sense at all analogous to the evil we know and experience precisely because we are, would such non-existence be an evil? For whom in the hypothesis of no other realitv would the eternal self-sufficiency of the Godhead be an evil? For God? Surely generosity is a most desirable way of being good, this for man. It is also most desirable for God in the

supposition that He has determined from eternity to be such. Of his nature and by the laws of logical possibilities and corresponding necessities God can be generous, and indeed He must be either benevolent or non-benevolent. He is not necessarily determined to one rather than the other, but He must be one or the other. He can be either; cannot be both; must be one; and is that one (generous) and not the other (non-generous) freely. Nowhere in all of this does it follow that, because He is freely benevolent (and hence praiseworthy for man), He could have been vicious.

Hence to return to the problem with which we began. II one searches for the justification of obedience to divine commands, one does not look for a norm to which God's edicts must conform. Whether God creates or not, His eternal choice is good. And in the first case, acceptance of His will is good ultimately because a being that of its nature cannot but be good has so willed contingently. None of this has been proved. But to bypass and overlook it is myopic in analyzing the arguments theists have tried to derive from moral uprightness and rectitude as founded or grounded in divine goodness.

I surely do not by any means hold that moral seriousness is impossible without the conscious acceptance of God. But an attempt such as this to show the weakness of tracing morality to God's will is defective. It rests on the supposition that gratitude can be elicited only in response to a subject whose kindness could just as well have been malice or hostility.

The Christian holds that divine commands ought to be obeyed. When asked why, he can logically reply: "Because they are God's." Now, admittedly, there is the process (and it is often a most difficult one) of determining whether an imperative with divine pretensions is all it claims to be. But the Christian aware of this difficulty holds that there are cases when the claim can be authenticated (however in a concrete case a Catholic or a Protestant might go about doing it). And the agnostic or even the atheist ought not, I think, call him up short when he replies in answer to such questions that God's law is to be obeyed because it is God's. For they both know

that, as far as he is concerned, whatever God wills is good because He cannot will other than good, though with respect to creatures He need not from eternity have willed anything at all. To derive morality from the divine reason and will is not arbitrary. It has more to commend it than the treatment Hepburn gives it might indicate.

God and the Cosmos

But it is not merely to one type of argument that Hepburn devotes his attention. He introduces as well a surprising number of variations of the proof resting on the principle of causality. He has reservations at points that illustrate the difficulty that arises when a theist formulates this principle vaguely or inaccurately .[9] But he does not hesitate so much as a result of this as for another set of reasons. One of those would, I think, offer a fruitful ground for discussion. It is introduced with the hope of clarifying in part what the theist considers a rational justification for his belief in a transcendent God.

Hepburn, hypothetically conceding the principle of causality, asks whether the causal regress this involves is acceptable for the Christian. He implies that the result is incompatible with faith based on the Gospel.[10] The element of divine transcendence and otherness is called into play. Can a God who simply completes the universal complex of causes and effects really be said to be other than part of the whole set? Here Hepburn refers to Paul Tillich,[11] and the reader will likely enough think of Bishop Robinson, perhaps because of a similar ideological dependence in the latter. God as the first cause becomes just the " missing piece of the cosmic jig-saw puzzle " as far as Hepburn is concerned. That piece is crucial but not as different from all the rest as religious piety expects and demands.

• "Every event has a cause," is given as an example; cf. 160-1.

[10] *Ibid.,* p. 166.

[11] *Ibid.,* p. 167.

God's Transcendence and Immanence

Here the relation between divine transcendence and immanence is at stake. The objection of Hepburn could be summarized in the form of a dilemma. Either what Christians designate as God is the causally primary factor of the being that is experienced or not. If so, His transcendence vanishes; if not, then His otherness keeps Him from being related to the world and thus knowable through it. In the first hypothesis, the foundation for adoration crumbles; in the second, there are no traces of the Maker in His handiwork. Neither is an attractive alternative.

This is the sort of difficulty that lies at the root of much malaise today religiously and theologically when the God-question is under study. The relation between the Infinite and finite has offered not a little stimulus for considerations of God in a frame of reference that is both processional and relational. [12]

Theological Precedents

Not infrequently Catholic apologists intent on defending the divine freedom insisted that creation is an operation of God that is formally immanent and virtually transient. This was further qualified with the statement that the difference between a Creator-God and a God who did not create lay on the part of the creature. God was assumed to be ontologically indifferent whether there were creatures or not. Though He was eternally Creator, His works nonetheless came to be in time. The Creator-creature relationship was real on the part of the latter but not for Him. It simply designated Him by reference to a finite other *(denominatio ab extrinseco).*

I think such a presentation has been detrimental and shows

[12] Cf. Eugene Fontinell, "Religious Truth in a Relational and Prccessive World," in *Cross Currents* 16 (1967), !e83-315. The same concern made itself felt much earlier as well in the American philosophical tradition; see Charles Hartshorne and William Reese, *Philosophers Speak of God* (Chicago: Univ. of Chicago Press, 1953), esp. 1-!e5. For those interested in a study of Hartshorne's view, an excellent conspectus is presented by Ralph E. James in *The Concrete God* (Indianapolis-Kansas City-New York: Bobbs-Merrill, 1967).

its effects in the way men like Hepburn judge the theistic approach to God. How can a God who is not really related to creation be at all involved in its origin, continuation, and outcome, even to the extent that His evidences left therein point Him out to thos.e who look and reflect on what they see? But if He is so involved or immanent, then is He not precisely a part, however important that one may be, in the whole?

A good number of Catholic theologians have sensed this difficulty. Karl Rahner has posited the theological hypothesis that God can change as a result of creation, not in Himself, to be sure, but at least in relation to the other/[13] Bernard Lonergan writes of contingent predications that involve God Himself as cause and constituent of a complex reality but with a finite being related as subsequent condition to Him.[14] This means that, though God is and must be totally uncaused, by His free choice He is nevertheless conditioned subsequently by His creatures. It is by way of adding to such insights that I should like to offer tentatively the following observations.

Divine Necessity-Contingency: A Suggested Hypothesis

If God is infinite in perfection, if He is pure act, subsistent being, unlimited existence, uncaused reality, this He is by necessity. He could not be otherwise. Now such a perfect being need not create but can. Whichever alternative is realized (and they cannot be simultaneous), it will be so eternally. He is no more or less perfect as Creator than as a Triune Community existing in its own self-sufficiency. But if He is Creator, it is not the same, even for Him, as if He had eternally opted for the opposite. The difference does not lie in greater or lesser perfection, for that is infinite in either case. It is rather in the ·factthat Infinite Being, which is capable of two mutually

[18] Karl Rahner, S. J., *Theological Investigations,* I (Baltimore: Helicon), 179-81. See also the *possibility* of creation as p1-esupposingthat of the Incarnation of the Son in his "Natur und Gnade," from *Fragen der Theologie Haute* (Ziirich-Cologne, 1958)' 218-9.

[u] Bernard J. Lonergan, S. J., *De Deo Trino, Pars Systematica* (Rome, 1964), 217-60.

exclusive modes of eternal self-realization, actually exists in one rather than the other.

For the Christian theist, the creativity of God lies in the divine mind and will. It is a play on words to say that the latter are identical whether they embrace solely the Godhead in its unity of nature or whether they offer it to others, who are thus constituted or posited in being as potential recipients of divine goodness. God loving Himself and no one else from eternity is no less or more perfect than God freely offering Himself to creatures, whose very reality is to be beneficiaries. But He *is* different; not different from what He was, not different from what He will be, but different from what He could have been. Greater or lesser perfection are terms that pose the problem in a way that is a waste of time and a bore. Can infinite perfection be realized in two different ways? That is the question. If so and if it is realized in such wise that from divine intelligence and love creatures take their origin, then God is not extrinsically but intrinsically a Creator. His very being is to create but, of course, to create freely. It makes a difference for creatures, too, and because of the difference creatures can and should be grateful.

The truth that God has been so much more than He had to be, the truth that what He had to be for Himself He has chosen to be freely for others-this is not something abstract but concrete. It also lends itself to being preached as a kerygma. He transcends the categories of necessity and contingency. What He is (Creator) He is freely and contingently. But He could have been otherwise and had to opt eternally to be one or the other. Here is a necessity that is identical with an actual contingency, though the latter is concretely matched by an opposite that was a real alternative if never a realized condition of being.

Christian theism has maintained that the necessary God has freely immersed Himself in human life and history, above all in Jesus of Nazareth and His Church. That immersion is the same type of reality the philosopher has usually meant when he introduced the term causality. At the heart of Christianity is,

therefore, the assertion that the Transcendent is really causally operative in finite being.

But because God is thus presented in relation to creatures, that does not make Him just another element in the universe like others. When man with his abstractions speaks of the finite in the realm of being, the very notion involved extends to yet more and calls for the Infinite. But far more than two letters (one capitalized) make the difference between them, and their similarity is never so great that the dissimilarity is not greater. Yet both *are*, though one *is* only in dependence on the other. The notion of creaturehood is intelligible only in reference to that of divine Creativity. But the reality of being Creator is likewise intrinsically related to the reality of creatures. The Creator does need creatures, though God as God does not. Perhaps this will seem in serious need of justification. But it will not help to confront one who so thinks with the charge that his God is either a cause and part of the world (and so not God) , or not part of the world, not its cause, and therefore God but not Creator. The Christian can aim at showing that his belief in a God who is both is justified. In short, one who hypothetically accepts that all finite being demands a cause will have to do more than assert that its cause is either a part of being and therefore finite too or not a part and so not cause either. That is simply missing the point. Real coexistence between Infinite and finite cannot be excluded. This would involve an ontological primacy on the part of the former that would leave its traces in the entire being of the latter.

CARL **J.** PETER

The Catholic University of America
Washington, D. C.

SCHILLEBEECKX'S NEW LOOK AT SECULARITY: A NOTE

"ZEALOUS attempts at refutation never get us on a thinker's path." [1] This statement of Martin Heidegger will serve to set the tenor of the following reflections upon a new and searching investigation by Edward Schillbeeckx into the problem of Christian secularity. The fullest crystallization of his thought appears in an essay appended as an Epilogue to *God the Future of Man/* a collection of lectures delivered by Schillebeeckx throughout the United States during 1967. This essay is an English translation of an article written shortly after his return to the Nether lands and published in *Tijdschrift voor Theologie* (1, Jan.-Febr.-Mrt., 1968, pp. 44-66). It is a noteworthy study for at least three reasons: (1) it represents an advance and a qualitatively new phase in Schillebeeckx's own thinking on what has been the central concern, if not the very nerve, of nearly all his recent theological endeavors; as such it is perhaps the most thoroughly thought-out and closely reasoned study from a Catholic viewpoint yet to appear on the problem of secularity. [3] (2) It is

[1] Martin Heidegger: "Who is Nietzsche's Zarathustra? ", *Review of Metaphysics* (March, 1967), p.

[2] Edward Schillebeeckx, 0. P., *God the Future of Man,* trans!. by N. D. Smith (New York: Sheed and Ward, 1968).

[3] The study by Robert L. Richard, S. J., *Secularization Theology* (N. Y.: Herder and Herder, 1967), largely confines itself to the Protestant terms of the debate; that of M. D. Chenu, 0. P. ("The Need for a Theology of the World" in "Should Christianity be Secularized? A Symposium" published in *The Great Ideas Today,* 1967, Encyclopaedia Britannica, Inc.) is content to base itself on the distinction between religion and faith, although a more profuse approach to the general problem can be found in his two-volume work *La Parole de Dieu* (Paris: Editions du Cerf, 1964); Eric Mascall's *The Secularization of Christianity* (N. Y.: Holt, Rinehart & Winston, 1965), while written by an Anglican, is one of the few critical studies, but it envinces little sympathy for the Secularization project; a Catholic study with similar strong reservations is Jean Danielou, *L'Oraison probleme politique* (Paris: Fayard, 1965).

carefully nuanced so as to preclude or answer the serious objections that have been forthcoming all along against the secularization project; most notably this is done by insisting upon distinguishing secularization in its limited theological meaning from its much broader sociological acceptation. [4] (3) But, most significantly, it represents less a qualification of Schillebeeckx's earlier thinking than the adoption of a more radical stance. •

The new point of departure lies with the very concept of God. How he is viewed in the objective conceptualization of Christian faith, then, will determine the validity of the secularization project. This is clear recognition that it is the reality of God himself and man's intellectual "hold " in faith thereupon that is determinative of the proper religious response and not existential concerns about man's existence or socio-religious concerns about relevancy. What Schillebeeckx proposes is a de-emphasis upon those conceptualizations of God that have been traditional within Catholic theology, allowing them to be replaced by one that designates God *as man's future.* This gives his thinking a point of convergence with both the newer theologies of hope, best represented perhaps by Jorgen Moltmann, and the efforts of the Pannenberg Circle to structure theology as history; at the same time it marks an initial disassociation from existential theology.

Such a proposal, however, does raise questions of its own, the first of which is whether this overriding envisagement of God as man's future does not constrict God conceptually within a human perspective. To be sure, there is no other perspective *out of which* he becomes available for man, but it is one thing to conceive of him by means of concepts deriving from and representing creatures, with the explicit recognition that he " lives " far beyond the reach of any of our concepts, and on the other hand, to give primacy to a concept that locates God, gnoseologically, *within* the human and temporal sphere, even

• This is somewhat similar to the distinction drawn by F. Gogarten between " secularity " and " secularism "; the same distinction also appears in Gabriel Vahanian's *The Death of God.*

that of the unknown future. This is by no means to suggest that God *is* solely within the world-Schillebeeckx unmistakeably insists upon the utter transcendence of God-but he is simultaneously immanent to creation, and it is here in the latter sphere that Schillebeeckx would give to faith its objective locus.

This means that the dialectic indigenous to Christianity is no longer that of time and eternity (as is true even in the Barth-Bultmann axis) but of promise and fulfillment. But does not faith spread its roots into the speculative understanding so that the very act of belief spontaneously urges upon us the first aporia? Can the prmnise-fulfillment dialectic itself be constrained to the temporal and earthly realm? Concealed beneath this is the further question as to whether justice can be done to the possibilities for understanding opened up by the faith without some recourse to the Greek experiment as it came to be Christianized, assuming that even Existentialism finds a touchstone in the Hellenic achievement. Schillebeeckx readily acknowledges the influence upon him of his American experience and the pragmatic tradition. To those nurtured in that intellectual temper it may well appear less beguiling and more of a mixed blessing where cognitive expression of faith is concerned.

If there be indeed a meta-history for man, and Schillebeeckx does, of course, expressly allow for this, then God is meaningfu) for him other than as his earthly and temporal future (meaning a temporal future *with God)* that is something more than merely the world's future, which Schillebeeckx characterises as "humanization of the world, but directed towards the eschaton." (p. 199) But his preoccupation with the horizontal level to lived-faith, while no denial of the vertical, does seem to enervate any effective influx of the latter upon the former. Man's structuring of the world is somewhat remote from his personal encounter with God. This in fact effects something of a depersonalization where man himself is concerned, if the meaningfulness of a seventy-odd year life expectancy is seen so markedly in terms of the contribution one makes to an un-

known future. There is reason enough already to fear a capitulation of the truly personal to the inhuman forces of a computerized world.

It is difficult to see how there is not a further " erosion of the mystery " implicit here in the de-emphasis on the emergence of the Divine Reality as *Ineffable Person.* If faith is " to become secular" and God" less tangible" (p. 190), then surely there is going to be a lessening of that climate of the spirit that makes possible contemplation and adoration, for the kind of religious response that in St. Paul issues repeatedly in the Doxology. This view is in contrast to the parable of the Samaritan Woman, reflecting the classical movement of the soul from incomprehension arising from sin, to confession, to acceptance of the Messiah, to adoration (" in spirit and truth ") , and finally to God's disclosure of his own personal identity. [5] Granted the place in language where we can speak about God is at the limits of language, still, if we cannot speak about God himself, we cannot speak about the rest of religion. [6] And one wonders if one can speak meaningfully about God and at the same time "set aside" *(epoche)* the metaphysical questions.

Underlying all this are the nuances Schillebeeckx gives to his understanding of faith; emphases which stress its empirical and (as in Blondel) conative character. "Our faith in God will then become secular; in other words, it will assume the form of a love of man which is opposed to history without salvation ... ," (p. 190) and thus, "in our new culture, then, a theological treatise about God will be the culmination and completion of an exegesis which consists in the practice of Christian life." (p. 186) But is it not necessary to insist that the faith concepts already achieved, however inadequate and necessarily developmental, must serve as authentic points of departure for this practice? Human faith without a cognitive dimension, and therefore some objectification into concept, is impossible,

• Cf. Hans Urs von Balthasar: *Prayer,* transl. by A. V. Littledale (New York: Sheed and Ward, 1961), p. 'i!00.

• Carlo Huber, S. J., " Speaking About God in a Secular World," *IDO-C* North America (April, 1968).

but Schillebeeckx's thesis, while granting this, would seemingly allow that none of the faith-conceptualizations of the past are irrevocable. The God of our future will appear as the " Wholly New One." (p. 186) John Dewey's observation, that what we cannot say is that truth remains the same while our conceptualizations of it alter, would seem to be a correct one, if newer concepts are seen as breaking continuity entirely with those out of which they emerge. The roots of this thinking lie in Schillebeeckx's epistemological conviction that concepts of *themselves* possess no value of the real.[7] In fairness, however, it needs to be noted that in earlier writings he has staunchly defended an irrevocable " directedness " to authentic faith-concepts of the past.[8] That earlier theological stance is not rejected in these later essays, but its operativeness on the practical level of lived-faith appears considerably muted.

It should be clear that Father Schillebeeckx is concerning himself only with " describing how faith must *function* in the new culture " lest it " remain an attitude that cannot be

• *Revelation et Theologie* (Bruxelles: Editions du Cep, 1965), p. !l34: " Quoique les concepts soient inadequats et meme, en tant qu'abstraits, ne possedent en eux-memes et par eux-memes aucune valeur de realite (ce que le concept abstrait fait connaitre se situe dans la realite concrete et est done realise autrement que dans le concept), ils possedent, en liaison avec !'aspect non conceptuel, une valeur de realite,-inadequate, sans doute, mais cependant reelle-car ils donnent. (et eux seuls) une direction et un sens a !'elan qui, a partir des concepts, nous porte vers la realite." The English translation of the above work *(Revelation and Theology,* !l vols., N.Y.: Sheed and Ward, 1968) by N. D. Smith renders the above passage as follows: " Therefore, although concepts are insufficient and even do not reach reality in themselves--that is, seen in their exclusive abstract character-they have a certainly inadequate but nonetheless real truth and validity as included in the non-conceptual consciousness, because they-and they alone-impart a direction and meaning to the transcending beyond the concepts to reality." Vol. !l, p. !lO.

[8] *Op.* cit., p. 109: "... la valeur de connaissance objective, vraie, speculative, de nos concepts de foi consiste dans leur ' *projection' objective* dans la direction indiquee (et dans aucune autre) par le sens lui-meme de ces concepts ..." (in the English version, Vol. 1, pp. 1!l4-125); p. !l39: "En ce sens, l' aspect conceptual des formules dogmatiques fait egalement partie de l'object de foi, c'est-a-dire du dogme." ... ; p. !l41: "Si une verite proclamee comme dogme ne peut jamais etre rejetee ..." (for some unknown reason the second of the three citations above is entirely omitted from the English translation, cf. Vol. 2, p. !l5; the last citation can be found on p. !lB.).

realised" (p. 187); he is not then confusing faith in God with human culturization, much less implying that a God of man's future is a mere projection of man's spirit. Still, to put questions to what Schillebeeckx feels is the answer here is not (as he himself says) for one to demand that the Christian faith " be made perfectly clear for once and for all " (p. 187); it is only to be of the opinion that there must be some focal point. of certitude and cognitive clarity that can serve as a starting point. Similarly, to say that otherwise " dialogue will be factually concerned with different cultural worlds " (p. 188) does not seem to allow sufficient scope to other modes of living and thinking upon faith. First of all, the noetic approach to God by way of past conceptualizations is not necessarily a denial of genuine "encounter" in presentiality, with even objective nuances of relevancy; and secondly, the whole point of dialogue is to offer a unique Christian directedness to the project of explaining man to himself and building the world. I am less resistant to Schillebeeckx's thesis here than I am dubious as to its being integral enough.

A practical consequence of all this is how Schillebeeckx envisions the Christian's involvement in the socio-historical progress of the world; he characterizes this as one of " critical negativity," (p. **191)** a kind of prophetic protest against any human ideology which lays claim to finality. The observation of Olivier Rabut to the effect that there is "no contradiction between Christian adhesion to the faith with its value of enlightenment and a suspension of judgement " [9] lends support to this thesis. But is the "enlightenment" as little and as negative as all this? Pere Chenu espouses a more positive attitude when he describes the Word of God as a pure " presence " following the rhythm of that humanization that lies embedded in history. [10] Even here, however, one can ask whether God's Word, without breaking continuity with the

• Olivier Rabut, *La verification religieuse* (Paris: Editions du Cerf, 1964), p. 95.

[1°] Cf. C. J. Geffre, 0. P., paraphrasing the thought of Pere Chenu's *L'Evangile dans le temps,* Vol. 2 of *La Parole de Dieu.,* in " Desacralization and the Spiritual Life," *Concilium,* Vol. 19, p. 114.

humanization of natural history, does not introduce a rhythm of its own, summoning to something new, a "new creation." The further question can be put to Chenu-as to Teilhard de Chardin as well-as to how this makes room for the mystery of iniquity, the awesome power to negate that is inherent in human freedom. Schillebeeckx's "critical negativity" does seem to take the problem of evil more seriously and has the advantage of seeing evil as an ultimate preference of creaturely truth to that of God. All the same, the negativity of faith seems uppermost here. "The Christian has as little positive idea as the non-Christian of what is worthy of man, either ultimately or here and now." (p. 191) But does this do justice to the Christian's explicit envisagement of God as transcendent and his awareness of the Resurrection as already present for faith?

By contrast, the view of history fostered here is that of history itself (i.e., man's history with God, but all human history and not just the *Heilsgeschichte)* as progressive. Such optimism can be tempered with Martin Buss's observation that the Old Testament view of history more often sees it as the work of human disobedience, and the New Testament accounts of the life of Christ point up the futility of history as it leads, and can only lead, to the cross.[11] Nevertheless, it seems that John Cobb offers an authentic way out of the apparent dilemma, explaining that" man's sin is not the final word, that God works through it and around it so that history moves towards its fulfillment in God in spite of what man does as much as because of it." [12] This apparently is what Schillebeeckx also intends. The question it leaves with us is whether

[11] Martin Buss: "The Meaning of History" in *Theology aJf History,* Vol. 8 of *New Frontiers in Theology* (N.Y., Evanston, & London: Harper and Row, 1967): "... Apocalyptic literature clearly implies that history moves progressively downward, until it is overthrown by the Eternal Kingdom" (pp. 146-147); "It is true that for Christians Jesus Christ constitutes the center of history, but as historical event his life culminates in the cross, a symbol of the complete failure of existence." (p. 150)

[10] John B. Cobb, Jr.: "Past, Present, and Future" in *Theology as History,* Vol. 8 of *New Frontiers in Theology,* p. 199.

the illuminative power of faith does not call for something more than " critical negativity " in the face of human ideologies.

God is indeed a God of promises, and each promise fulfilled does open up new horizons of possibility for the future. Our attachment to the past has been excessive, so that where faith is concerned the deculturization process must be carried on. This is, in tendency at least, secularity. But the reservation felt towards Schillebeeckx's project is that it is not clear how it makes any allowance for a positive contribution to the future that is Christian in any specific and explicit way. What is lacking is reference to the Christian *vi:;-ion,* as something dogmatic and doctrinal in kind. Our future is surely a future with God; the Incarnation, as Balthasar has observed, cannot be looked upon as a provisional arrangement which cancels itself out once it effects salvation.[13] Still the body of Christ today is a glorified body, and so in a real sense Christ has already achieved his future, one, moreover, that we know will be ours and that indeed is already in the process of realization. Schillebeeckx, of course, denies none of this; at the same time it is a dimension of faith that appears entirely inoperative in his new understanding of Christian secularity.

The foregoing critical remarks-or, more accurately, posing of questions would be unjustifiable were it not for the unquestioned caliber of this theological essay. I£ its positive contributions have not been articulated here, that is because the author has set them out in far greater clarity than I might reproduce them here. For the sake of supplying some perspective, however, it should be stressed that Schillebeeckx is talking about" a post-terrestrial future" and suggesting that " Christian faith ... can only be seen to be true if this eschatological hope shows itself capable of bringing mankind a better future here and now." (p. 188) The point of departure for this is the new culture, which as " not primarily directed towards the past but dynamically orientated towards the future " (p. 179) is not at all inimical to the Christian vision. At the same time " for Christianity the foundation, norm and criterion of every future

[13] *Op. cit.*, p. 208.

expectation is its relationship with the past, i.e., with Jesus of Nazareth and what has taken place in him." (p. 189) There is no question then, as for the so-called Christian atheists, of eliminating God; closer to the mark would be Bonhoeffer's living before God, "etsi Deus non daretur." [14] There is no denial either of man's present communication with God, but there is a hesitancy in the face of the conceptual forms that such communication assumes, especially as these bear the burden of the past, and in particular where the conceptual recognition of God himself is concerned. The question all this poses is how religionless may faith become without losing its sap. Is there not in Schillebeeckx's provisional answer an overplayed emphasis on " waiting in silence," and a missing dimension that needs restoring? The question at least does merit being asked.

WILLIAM J. HILL, O. P.

Dominican House of Studies
Washington, D. C.

[14] Dietrich Bonhoeffer, *Letters and Papers from Prison* (N. Y.: Macmillan, 1958), Letter of July 16, 1944, pp. !218-!219: "There is no longer any need for QQd as a working hypothesis ... we have to live in the world *etsi Deus non daretur*. ... And this is just what we do see-before God! . . . God is teaching us that we must live as men who can get along very well without him. . . . Before God and with him we live without God.",

BOOK REVIEWS

Faith and Theology. By M.D. CHENU, O. P. New York: The Macmillan Company, 1968. Pp. Qfl7. $6.95.

There is a prophetical ring to the titles of these chapters collected from articles published by Chenu over the last forty years. The contents range over the relation between biblical and theological language, the relationship between theologians and bishops, the spirituality of matter, corporality and temporality as human situation, the solidarity of the proletariat and the solidarity of the Mystical Body, and the condition of man in a technological civilization. Many of these essays owe their origin to Chenu's remarkable availability to all the important movements of French intellectual life. Father Chenu's Parisian study is today, as it has been for forty years, the gathering place for historians, scientists, sociologists, philosophers, artists, and theologians.

For the American reader, it is not out of place to mention what is well-known to the French. Anyone hoping to explain the development of the Catholic revival of the last quarter-century will find the personality of Chenu frequently an important factor in some of its greatest moments.

Returning from doctoral studies in Rome, Chenu became in the late 19QO's the disciple and protege of Mandonnet, the historian. After him, and along with Etienne Gilson, Chenu produced a theological style which has marked the whole school of French Dominicans in this century. He was sensitive to Sertillanges's proposal that theology must relearn to respect the *revealed datum* as the fundamental norm of true theology. He also followed Mandonnet in promoting an historical study of St. Thomas. His then controversial book, *Le Saulchoir, une ecole de theologie,* published in 1937, was effectively an appeal to go back to the sources of Christian theology precisely in order to do justice to the great medieval theological tradition of St. Thomas and his commentators. It is noteworthy that this work, which today strikes us as in no way remarkable except for the enthusiastic vigor of its style, met with extreme disapproval in Rome and was subsequently removed from circulation.

Despite Rome's disapproval, however, Chenu's influence did distinctly mark the development of one of the most important European theological schools of this century, viz., Le Saulchoir, the Dominican House of Studies of the Province of Paris. Both during its location at Kain, in Belgium, and later in the 1930's at Juvisy and Etiolles (its present location) , Le Saulchoir has been the school of a number of important theological personalities. Yves Cougar must be numbered as the most prominent of these;

he has long been Chenu's most famous disciple and colleague. Likewise Dominique and Andre Dubarle, Andre Liege, Claude Geffre, and Edouard Schillebeeckx have all been affiliated at some time with Le Saulchoir, as have been such biblical scholars as Roland de Vaux and Pierre Benoit. It was Chenu more than any other who saw this extraordinary theological school through the teeming excitement, the frequent conflicts, and the shifting climate of the past twenty-five years.

Chenu taught Greek, History of Dogma, and began a course introducing the beginners in theology to the literature and thought of medieval theology. This course eventually led to his book, *Toward Understanding Saint Thomas* (English translation, 1964). This introduction is a total history: the social and economic dimensions of the period are blended with a philological and literary understanding of the period. It is a sort of history of whatever manifestation of human vitality might give added meaning to the theological phenomenon which was the *corpus Thomisticum.* Chenu's most respected work, *La theologie au douzieme siecle* (1957), is another product of this same methodology.

It is not quite so surprising, then, that Dominique Chenu, known principally as an historian and medievalist, should have produced the present thoroughly contemporary and relevant work. His approach to the Church is much like his approach to and 13th century Christendom. He finds clues to the real work of theology in the increased socialization of man, the economic organization of nations, and new patterns of class structure. Pope John XXIII's by-word becomes a keystone for Chenu's theology: " The signs of the times " are an inescapable hermeneutic for where grace and theology must operate. " The whole of man, all his capacities and all his activities, is assumed by grace. . . . And the social structure of man is fundamental to his development. . .. If the social dimension is not assumed by Christ, a basic element of man is rejected and lost."

This authentically Thomistic emphasis on the legitimate autonomy of the temporal order finds its strongest expression in the chapter on the human situation: "Corporality and Temporality." There Chenu shows how the concepts of *time* and *body* fluctuated between Platonic-Augustinian disdain for matter and Aristotelian insistence upon hylomorphic union with true mutual causality of matter and form. Yet each moment toward the development of high scholasticism made a contribution of genius. Augustine does not become a villain, even if one passes a severe judgment upon Augustinian exemplarism. " We have gone beyond the anthropology of Aristotle who had no sense of history; we have borrowed some of the Christian personalism of Augustine. But it is from Aristotle that we get *the sense of the concrete human situation* which the nco-Platonic spiritualism of Augustine ignored-and still ignores wherever it dominates Christian thought. . . . Augustine does have a sense of temporality, but

he regards it as an evil (symbolized and realized by senile decay} from which Christ will free us; Thomas Aquinas recognizes the meaning and the value of *corporality* both of man and of the cosmos. It is on this basis, on the philosophical level at any rate, that St. Thomas founds his optimistic vision of man and of the world."

This openness at once to Augustine's sense of personal responsibility before God and to Aristotle's epistemological and psychological realism are the Thomistic foundation for historicity and involvement in the world. Man's intellect is an embodied intellect; and to be in a body is to be in time. " Time enters into the definition of the human being, no doubt as an index to his weakness in his condition as a creature, but especially as an essential co-ordinate of his existence in the world. This human time expresses itself by the process of aging, the inevitable effect of the changeable quality of matter. But it is by no means the result of a failure of the spirit and must not be connected with the consequences of sin. The reason is that all was not supplied together: the creation continues, and man is in the midst of time as co-operator with the eternal God."

The last chapter deals with the condition of man in a technological civilization. The problem is the fear that desacralization will mean de-Christianization. " Technology involves man frankly in the making of the universe. Man assumes this power of world-making; he gives the universe its meaning, and in it he experiences and affirms his own autonomy. The world is 'profane' in its nature and its history. At this level there is no divine intervention to compete with, or even share in, the rational, calculated, mechanical activity of man. Does God then lose his *raison d'etre?* Certainly not! Nor is his presence diminished .... If religion is to be an emanation of faith in the word of God it will strike off the shackles of primitive ignorance and discover the real presence of the Creator within the autonomous human project of world-construction. It is a feeble theology which would impose on God something which human co-creative liberty can itself accomplish."

Here we have seen the two themes that unify the research of Chenu's entire work: the anthropological solidarity of man with the cosmos and the co-creative responsibility of man in an on-going creative order. Chenu's attitude in this work is perhaps best summed up in his comment: *"It is virtually blasphemous to think of the faith of Christ and the success of the incarnation as bound up with a pre-technological civilization."* New awarenesses are springing up constantly of what cosmic solidarity means-in a technological and industrial era, in a world dominated by new sciences. It is difficult for our concept of God to keep pace with our awareness of man's autonomous creativity. Chenu's work here certainly does not solve all the problems of the theological integration of human technology and divine creativity. But it does make a convincing case for asking the question meaningfully within the context of those two themes of cosmic solidarity and human-divine co-creativity.

It is easy to concur with E. L. Mascall's judgment: this book of Chenu's could hardly be bettered as an example of the way in which real theology is relevant to real life.

PAUL PHILIBERT, O.P.

Providence College
Providence, R. I.

The True Priest. The Priesthood as Preached and Practised by St. Augustine. By CARDINAL MicHELE PELLEGRINO. New York: Philosophical Library, 1968. Pp. 184. $6.00.

The Cardinal Archbishop of Turin has given us in this book not a treatise on the priesthood but a series of valuable reflections on some of the problems of the priesthood as he has seen them in the light of his readings in St. Augustine. His method has been for the most part to allow his distinguished mentor to speak for himself, adding his own observations as they seem to correspond with the demands of the particular circumstances in which the chapters of the book were originally composed.

Cardinal Pellegrino's immediate concern in the publication of this book has been the spiritual growth of the priests of his own archdiocese. His view of the priesthood has not been distorted, however, by scientific surveys or by tensions generated within specific areas of priestly activity. The true priest, as the Cardinal sees him, is one who responds humbly and unselfishly to the demands of his priestly environment. From the deep wellsprings of an enlightened interior life the charity which spreads God's mantle over his works of zeal finds intelligent and meaningful direction.

The Cardinal is especially concerned about the priests of his archdiocese who have been led away from the priestly family by "painful happenings whose inner meaning is known to God alone." His burden, as he thus reflects upon it, is that of every episopcal ordinary. His plea for the priestly holiness that will overcome defections is timeless in its validity. He never loses sight of the eternal reality of the priesthood as Christ instituted it as he ponders the disastrous consequences of passing events.

The first seven chapter headings, each a direct quotation from St. Augustine, serve as starting points for the Cardinal's reflection and analysis.

"Taken by surprise and made a priest." In this chapter the Cardinal draws from two of St. Augustine's sermons the guiding principles which seem to have led the future Bishop of Hippo to renounce the promising worldly career which was opening up to him. Augustine did not go apart from those who love the world merely to vie with those who hold rule over the people. He did not aspire to become a priest. These words do not imply, of course, the kind of unwillingness that was evident, for

example, in Maurice de Talleyrand-Perigord, who never should have been allowed to enter the seminary, much less to be consecrated a bishop. What Augustine really means is that his commitment to pursue the ideals of priestly holiness encountered the deadening pressures of worldly realities. He experienced a healthy dread of administrative responsibility. Yet he saw the hand of God behind it all, and he willingly sacrificed the joys of heavenly contemplation as the immediately urgent problems of his position commanded his attention.

Augustine sees the priesthood as a call to the service of the Church. And the Cardinal adds his own observation that " Augustine would certainly not have agreed with those who boast loudly of the illustrious contributions made by priests and bishops of various eras to the arts and sciences, when theological studies and the care of souls may have been badly neglected."

Cardinal Pellegrino finds Augustine's concept of the core of the priestly ministry in a phrase formulated in two of his early letters and recalled shortly before his death in a conversation with his biographer Possidius: the priest is a man who administers to the people the Mystery and the Word of God. The Cardinal notes that the word" mystery" embraces the various liturgical aspects of the episcopal office. Augustine, he says, was inclined to meditate on the inner truth of the Word of God and its meaning for the Christian life. He had some misgivings about " rapturous reflections on, or technical tabulation of, the externals of liturgical practice." (p. 89) He thought of every Sunday as a little Easter on which the Resurrection of the Lord was to be commemorated in the liturgical assembly presided over by the bishop who listened to the readings, celebrated the sacrifice and distributed Communion. He attached great importance to the ministry to sinners and to the expiation by penance of scandalous faults. The Cardinal notes that Augustine does not speak of the dignity of the priesthood in language comparable to that of St. John Chrysostom. Nor does he meditate at length on the intimate relation between the priest and Christ which has inspired many recent studies of the priesthood. He sees the priesthood essentially as a social function, by which the priest is consecrated unremittingly to the service of the Church.

In the fifth chapter this concept of service to the Church is elaborated in its relation to the preaching of the Word. The preacher, Augustine says, is the tongue of God. His own person is of little account. Whoever he may be, it is Christ who speaks through him. The Cardinal brings together the scriptural figures used by Augustine to represent the nature, value and efficacy of the Word of God: food, light, rain, manna, seed, etc. Perhaps this is the least attractive part of the book and the part least calculated to challenge the reader.

In the following chapter, however, the Cardinal develops a theme which makes his previous observations about the ministry of preaching more

meaningful. He recalls Augustine's strong conviction about the need of personal meditation by those to whom the Word of God is preached. Only God can speak effectively to the human understanding. Only He can touch the heart and move the will. The faithful can be " taught of God " (John 6: 45) only when there is faith in their hearts, so that Christ may teach them what the preacher tries to drum into their ears.

At the same time, the Cardinal recalls Augustine's deep sense of his responsibility to preach what the Lord wants the way the Lord wants him to preach it. " Dangerous is the office of preaching; safe is the status of the disciple." The preacher must not be afraid to speak out about matters which his hearers will not like. Augustine's words to a congregation at Bulla Regia are meaningful for our own day:

" I would not have said these things to you had I heard you well spoken of. But had I kept silent, I fear I would be judged together with you. God therefore willed, my brethren, that I should be passing through here. My brother (the local bishop) detained me, commanding, constraining and enjoining me to speak to you. Of what should I then have spoken to you if not of what frightens me most? "

And when his congregation applauded him, Augustine told them that their plaudits were not a feather in his cap but a millstone around his neck.

The Cardinal clarifies in the last chapter of his book the notion of the true priest as he finds it in Augustine's writings. It was necessary for Augustine to avoid the heretical implications of the Donatist teaching that the priesthood is nullified in those whose lives are scandalous and sacrilegious. An unworthy minister, Augustine says, does not cease for this reason to be a true minister. He gives something that is true, and thus valid, because it is of God. An unworthy priest, however, lacks that truth, or genuineness, which consists in a proper correspondence of his life to his office.

This commentary, though selective and summary, will hopefully afford some indication of the depth and timeliness of Cardinal Pellegrino's study. The work had been enhanced by a translation vigorous in its expression and seemingly faithful both to the Cardinal's own words and his citations from St. Augustine. This kind of spiritual literature will help to fill the void created by an over-secularized approach to the problem of priestly training that seems to overlook, if not positively to exclude, the formation of a truly priestly character in those who are to serve the Church.

THOMAS J. RILEY, D. D.

St. Peter's Rectory
Cambridge, Mass.

ContemJ>orary Spirituality. Edited by RoBERT GLEASON. New York: Macmillan, 1968. Pp. *343. $6.95.*

In the publishing trade this volume would be called a " non-book," because its contents should not have been put in a hard-cover book. The reasons for this are several: practically all the chapters of the book are reprints of articles that previously appeared in French, German, British or American journals; some of the articles orginally appeared fifteen years ago, so that one may wonder if they represent the thought of the author today.

Moreover, the title of the book is misleading. It is not a treatment of contemporary spirituality in the Church today but a discussion of various problem areas of religious life. Actually, the sub-title of the book, " Current Problems in Religious Life," should have been used as the title.

S. Lyonnet, S. J., opens the volume with a discussion of St. Paul's doctrine on freedom and the law, and he explains that, although the Christian is freed from the external law, he is nevertheless obliged to lead a holy and virtuous life because of the law of the Spirit. Because of this internal dynamism, the Christian is able to fulfill every Christian precept with complete liberty as a son of God.

The next few chapters treat of the theological virtues. **H.** Holstein, S. **J.,** takes up the question of faith, stressing its role as an experience of God, who is faithful to his promises. The Christian's experience of God's fidelity arouses a response of fidelity, obedience and hope in the soul of the believer. **B.** Olivier, 0. P., then discusses the meaning of Christian hope, which he sees as a communal virtue that has concrete existence in individual Christians. Finally, R. Gleason, S. J., elaborates several themes related to fraternal charity. After stating that love of neighbor is necessitated by man's very nature as a social being, he emphasizes the need of fraternal love on both the natural and supernatural levels of the Christian life. For Gleason, love is always a value; *"even if it be a guilty love,* it is still a great invitation to grace, so long as it is a *genuine* love." (p. 36) Approaching the problem of how the Christian can love Christ in his neighbor, Gleason rejects the explanation whereby we love our neighbor "as if" he were Christ. Rather, he maintains that, in probing to the utterly unique depth of the other person as person, we find God, who gives and sustains that uniqueness of person, and if the person be in grace, we actually find the Trinity dwelling in the soul through grace. (cf. p. 39)

Approaching the specific problems of religious life, K. Rahner, S. **J.,** poses numerous intriguing questions concerning the meaning of religious poverty and its adaptation to the modern world. One of the themes he repeats constantly is that, as long as the religious community is not poor, its members cannot be said to be living poverty. Rahner tends to reject the identification of poverty with dependence on the superior for the use

of material goods. Yet, he sees the need to provide a theology of poverty which will contain the essential notes of economic insecurity, witness and service to the People of God in the apostolate. Rahner recognizes also the need for an ascetical element in the practice of poverty, and in this respect he calls for an " asceticism with regard to consumptibles and luxuries." This can be observed if religious and their communities restrict themselves to legitimate needs and necessities.

Treating the question of celibacy, B. Haring, C. SS. R., limits himself to a discussion of various types of celibacy and thus justifies the celibate life which is freely accepted under the vow of chastity.

The problems related to religious obedience are treated in the next three chapters. T. Dubay, S.M., takes up the question of the psychological possibility of intellectual obedience; K. Rahner, S. J., offers some reflections on the nature of religious obedience; J. McKenzie, S. J., explains the concepts of authority and power in the New Testament. Doubtless, the attentive reader will see discrepancies between the teaching of Dubay and that of Raimer, but Dubay is concerned with the precise problem of submission of judgment to the command of a superior, while Rahner is describing obedience in terms of a commitment to a specific mode of life. However, this reviewer found Dubay's explanation unsatisfactory and wonders whether the author would explain the problem today as he did when he first published the article in *Review for Religious* in 1960.

Four other chapters of the book which are of special importance to religious life are those on prayer, the theology of work, contemplation and action, and transformation of the world and flight from the world. L. Lochet, writing on prayer, makes the statement: "Anyone can squeeze a few prayers into a life that remains outside the meaning of the Scriptures, but one cannot live a life of prayer, as the Gospels invite us to, if our human, this-world life is the center of our existence." (p. 171) He then proceeds to explore the manner in which a Christian can pray always, in accordance with the Gospel admonition.

N. Kinsella, O. C. S. O., writes of the theology of work but adds little to the traditional and as yet undeveloped doctrine. K. Truhlar, S. J., provides a thorough and satisfying study of the critical issue which lies at the root of the renewal and adaptation of religious life today: involvement with the world vs. separation from the world.

The chapter on contemplation and action-another theological dilemma for many modern religious-originally appeared in 1954 in a German theological review. Here again, the reviewer feels that E. Coreth, S. J., would hardly subscribe today to all that he wrote in his original article. As it stands, however, Coreth's interpretation of the teaching of St. Thomas Aquinas on action and contemplation and on the *"vita mixta"* will not go unchallenged by other theologians.

Other chapters in the book touch on a variety of subjects: holiness in

the Church, our Lady, suffering, childlike spirituality, emotional maturity, psychiatric aspects of maturity, and a sociological perspective of the crisis of Christianity. Some of them are written by internationally famous authors such as A. Pie, O. P., B. Ahern, C. P., L. Beirnaert, S. **J.,** and J. McKenzie, S. J. Nevertheless, one wonders why those articles were included in a book that promises to treat of current problems of religious life, while other critical areas of religious living were not discussed. Apart from three or four chapters that contain excellent material (and could have been read in the magazines in which they were first published), this book does not live up to the promise of its title or the blurb on the jacket.

JoRDAN AuMANN, O. P.

Aquinas Institute of Theology
Dubuque, Iowa

Personalities and Powers. By RoBERT E. MEAGHER. New York: Herder and Herder, 1968. Pp. 142. $3.50.

This book is aptly subtitled " a theology of personal becoming," which might more aptly have been prefaced by " an approach toward." For its contents and aim seem to be somewhat tentative and exploratory. At the end of his introduction, the author states: " Our project, then, will be to disclose the ways in which one might water himself down and to explore the chance, the limit, the possibility of man in an attempt to give it, or discover, its meaning. Throughout these reflections we will repeatedly confront three critical questions: Who am I? Who is my Lord? Which kingdom do I serve? What will emerge, it is hoped, is the realization that. each of these questions cannot be answered without answering the other two, that, in fact, they form a single inquiry into the meaning of the human limit. Personalities and powers and kingdoms all merge in the experience of human becoming, the experience of becoming a person, the experience of the infinite chance that is man, a chance that he, that I, am infinitely responsible to exploit. And if I am to ask who I am, I must. then be ready to serve a king and to further a kingdom; for man is nothing in himself." (pp. 30-31) A theology of man's becoming is still very much in development.

Robert Meagher, a 1966 graduate of Notre Dame University and a doctoral student in philosophical theology at the University of Chicago Divinity School when the book appeared, clearly declares his complete commitment to modern philosophy as a preparation and basis for his reflections upon Christian revelation. He considers " the historicity of truth, the ambiguity of truth, and the personal uniqueness of truth " (p.

22) to be its cardinal assumptions, and that Martin Heidegger is the "paradigmatic figure of modern philosophy in our century." (p. 84) Meagher contrasts classical and contemporary wisdom by proposing that Plato tried to ascend conceptually from the cave to contemplate eternal (non-historical truth) , while a Heideggerian project is a poetic ascent from the cave where " one creates values under *historically conditioned* (non-eternal) revelatory dispensations." (p. 85) Hegel is the great philosopher who really made possible the inquiry into the historicity of truth, and Heidegger has been the outstanding twentieth-century continuator of his thought.

The author maintains that, while classical philosophy was capable of raising the most basic questions about the world and man, its belief that truth is eternal makes any answers to such questions quite meaningless to modern man. For instance, although he himself acknowledges the probative power of the aristotelian-thomistic arguments for God's existence, they are not meaningful for him because of their powerlessness to convince him of God's love. His fundamental philosophical stance, therefore, is that truth and value are derived from personal decisions and, consequently, that what is true and good for one person is not necessarily so for another. He takes up the actual argument of the book in this context of his understanding of and commitment to modern philosophy.

For the purposes of that argument, he proposes that there are three standpoints on life: the decisional, the absolute, and the observational. These standpoints are different postures assumed by man in time and may vary during the course of one's life, although he usually lives in the standpoint of his chief concerns. The decisional is characterized by a conception of truth as authenticity growing out of complete self-determination and invention in total freedom. The absolute standpoint adopts the unrealizable ideal of pure objectivism and the possession of absolute truth. The observational is oriented toward truth as the discovery of approximations or generalizations through interpersonal relationships. The author considers that the absolute standpoint is an absurd ideal and that truth is relative from either of the other two standpoints. "Finally, if there is absolute truth, we must conclude that it lies beyond standpoints." (p. 41)

How one moves beyond particular standpoints toward the ultimate meaning of life calls for a further distinction that corresponds to the difference between the observational and decisional standpoints. This is the distinction between immediate and imaginary consciousness. The former occurs in moments of discovery and understanding that result from the awareness of impressions made upon man by the manifold stimuli of the immediate environment. The latter takes place in moments of invention and decision in which the past and future are both rendered present through memory and anticipation, when one's whole life, as it were, lies before him to be interpreted and decided. Imaginary conscious-

ness is uniquely human and enables man to encounter more than problems in life, namely, mysteries. It is in moments of freedom and creativity that man is confronted with the certainties of his own personal existence and of death and is called to decide either for being, or nothingness, as the final destiny of his becoming.

If a man opts for nothingness, then he absolutizes some standpoint by closing himself off from other possibilities. To opt for being, however, is to orient himself toward all truth, fully assenting to it in advance, amidst a life of uncertainty, of overcoming his prejudices and illusions. Thus the certainty of the quest for truth keeps him continually open regarding the mystery of life's ultimate meaningfulness in his dynamic and ever developing relationship with others and the world. This Socratic faith, as the author terms it, becomes Christian faith when the revelation of Jesus Christ is explicitly accepted into one's personal and eternal consciousness as the fully adequate answer to his open-ended quest. It still remains very much faith, however, and in no way removes the Christian from the realm of mystery.

For Meagher, the point of departure from particular standpoints is " the experience of personal becoming . . . *a coming to consciousness* and *a coming to decisiveness."* (p. 60) The open-ended quest for truth that follows upon the decision to live for being rather than nothingness is a continuously dynamic dialectic developing in depth amidst the ambiguities of life. It is a striving " to know all that one can know in the face of the knowledge of ignorance and to be all that one can be in the face of the threat of nothingness." (p. 61) He looks upon Tillich's method of correlation as involving a dialectic similar to what he proposes to be constitutive of faith, in that man himself is the question that must be posed before the revelatory answer can be meaningful. Faith as a quest finds in its seeking a clue to God's presence in existence, especially in the experiencing of created love as a prophetic promise pointing beyond itself to uncreated love. And so man is borne beyond any particular standpoint to an experience of the transcendent through the decision that the horizon of his hopes transcends the human limit.

The quest of Christian faith is founded upon the conviction that the revelation of Jesus Christ responds to man's openness toward truth. This dialectic of becoming oneself and becoming a Christian is lifelong, beginning with the original decision of conversion. Salvation, therefore, is not so much an assumed state as a path to be traversed. "What man confesses in both creation and redemption is that the word of God alone discloses the truth of all that comes to be and that this truth is the generous self-communication of Yahweh, the establishment of a covenant in which man is to trust for all things." (p. 109) On the other hand, the rejection of salvation is a denial of the absolute authority of God's Word to interpret the historical existence of his people. " To sin, then, is to recognize an

agency other than Yahweh's in the working out of Israel's destiny or to question the benevolence of Yahweh in the guidance of the people of God." (p. **111)** And this saving action of Yahweh" pervades every realm of life, public and private, religious and secular." (p. 118)

This book might be typified as an *apologia pro vita sua* by a young Christian intellectual. It is difficult reading, not only because of its profound content and intricate dialectic but also because too often it lacks a clarity of style. Nevertheless, it is worth the effort for those who are interested in the reflections of a young philosophical theologian upon the reasonableness of his stance on reality and faith. Its communicable value consists mainly in providing one paradigm for others to consider in their own self-questioning about their quest for the ultimate meaning of life. The Christian reader can behold in the author a model of one thinking believer who has come to grips with the mysterious depths of his faith and, through a probing dialectic, has preserved for himself both the human creativity and divine gratuitousness of his Christian vocation. He has resolved for himself rather well the inevitable tensions between the free and responsible activity of the believer, on the one hand, and the continual openness to the saving action of God's revealing and mysterious presence on the other. Man is called to respond to God's plan for him by the dynamic discovery of it in a lifelong quest of gradually becoming himself and a Christian. Consequently, he is not creative in the sense that he invents his own plan of life. " Man's most appropriate response to salvation, to the revelation of the truth of his own identity and that of all creation, is prayer or confession of the sort that one lives as well as speaks." (p. 140)

While some, probably several in our society, will be able to identify themselves with the author's apologetical pilgrimage, others will have not a few problems with the gaps in his thought. Their critical minds will not be satisfied with the way he leaps from standpoints and Socratic faith to Christian faith in his process of human and Christian becoming. Along the path there is not always continuity between his insights. For instance, his assertion that " there is an instinctive intuition which says that life without love is meaningless," while valid in itself, does not seem to be sufficiently supported by his rather relativistic notion of truth. More basically, the problem is that he has not really grounded the truth-value of such an assertion in a viable theory of theological epistemology. His work would have greatly benefited by devoting more consideration to the thought of theologians like Paul Tillich and Bernard Lonergan. Their notions about truth as historically, socially and culturally conditioned are rooted in a systematic epistemological stance that is basic to any reflective justification of one's option for being rather than nothingness regarding the mystery of life's ultimate meaningfulness. For, unless there is some quality in truth as we experience it by which it can point us absolutely

in the right direction, then our human consciousness seems utterly powerless to orient us toward the divine Absolute. Consequently, our Christian faith would be radically and totally discontinuous with our experience of personal becoming.

The apparent absence of any significant statements about the question of analogy and symbolism in religious language is a sign that this book is not prepared to confront the contemporary problems of belief and unbelief in their more technical dimensions. Although the author maintains that his commitment to modern philosophy does not blind him to other alternatives of theologizing, it does appear to have narrowed his vision enough to keep him from exposing his own notions to the critical light of more classical approaches. In his introduction (p. fll) he would ask that his position be heard in the private forum of an individual's reasons for the way and the why of his life, if it cannot be successfully defended " in the court of the history of ideas." But the fact of the matter is that he has chosen to publish his ideas, and so the public courts of theological learning have a right, indeed a responsibility, to hear their defense in the context of the history of ideas. I consider it fortunate for all of us in the academic community of theology that such a promising young Christian thinker has chosen to share his reflections in a book; and we look forward to hearing more from him. In the meantime, it is my hope that he will permit the wisdom of the ages to enlighten and mature his position more fully, at least as it is reflected through the minds of great contemporaries whose philosophical theologies are modern classics.

FREDERICK M. JELLY, O. P.

Dominican House of Studies
Washington, D. C.

De Homine. By ALorsms BoGLIOLO. Rome: The Lateran University Press, 1968. Pp. 395, with bibliography and name index.

This first of an intended three-volume treatise covering the entire field of philosophy by a distinguished professor of the Lateran University concerns itself with the study of man. It would appear that the two projected volumes will treat of the world and of God.

While the present volume is entitled *De Homine,* it cuts a somewhat wider swath than most manuals in philosophical psychology or anthropology. It is made up of what, in effect, are three distinct treatises of almost equal length. The first treats of those problems which are ordinarily covered in Logic; the second covers the traditional area of *Critica* or Gnoseology, and the third takes up the questions ordinarily treated in philosophical psychology.

The work claims to be an exposition of perennial philosophy according to the principles of Aquinas, updated to meet contemporary needs according to the norms laid down by Vatican II. Yet, the reader may seriously question whether this aim has been realistically met. The exposition of the *philosophia perennis* is certainly there, although there is little evidence of an attempt to correlate it with contemporary philosophical thought. Apart from a brief historical survey of some twenty-five pages which begins with early oriental philosophy and concludes with some of the prominent Thomist philosophers of the twentieth century, there is scarcely more than a passing mention of any philosopher other than St. Thomas himself. Exceptions occur only where various philosophers are listed as adversaries of a particular thesis, and in these instances the account is always brief and without a searching analysis of the positions described. One might also legitimately query whether the method the author employs is not more closely related to that of theology than of philosophy, for in numerous instances the authority alone of Aquinas would seem sufficient to prove a point. Consequently, it is to be feared that the reader would search in vain in this volume for fresh insights into contemporary philosophy and/or its relation to the philosophy of Aquinas.

On the positive side of the ledger, however, it must be said that in *De Homine* the author presents us with an extremely well-ordered synthesis of the philosophy of Aquinas as it pertains to logic, epistemology and philosophical psychology. He has a truly magisterial command of the thought of Aquinas, coupled with a singular gift for clear and concise exposition. His analysis of the nature of logic and its relation to metaphysics, as well as of the relation of judgment to reasoning and to the act of existence, is truly profound. One is aware that the author is not merely repeating the arguments of Aquinas, but that he has carefully weighed and counter-weighed them until he has been able to present a well-balanced and concise synthesis of his thought.

It also seems that there is much to be said for the author's combining of logic, epistemology and philosophical psychology in one volume. This approach serves to underline the sometimes partially overlooked fact that *all* of philosophy has to do with being, and that man himself finds both his ontological and psychic center to reside squarely within the horizon of being.

Since the book is in Latin, it will be of little practical use to the ordinary undergraduate student in college. Professors of philosophy, however, will surely find the volume of value no matter how great their expertise in the philosophy of Aquinas. As an accurate and well-organized synthesis of Aquinas's thought on almost all problems dealing with man and knowledge, it would, I believe, be hard to improve upon. Further, the wealth of brief but extremely apt quotations from Aquinas renders the volume valuable as a source book for the latter's thought on the central problems concerning man and his knowledge.

Finally, the volume is magnificently edited, though it is in soft cover. It is genuinely to be regretted, however, that there is no true index of subjects but only a detailed listing of chapter titles and subtitles. Almost equally regTettable is the absence of an index of the quotations from Aquinas according to subject matter and treatise. The inclusion of these items would greatly have enhanced the utility of the volume.

JAMES B. REICHMANN, S. J.

Seattle University
Seattle, Washington

Building the Human. By RoBERT 0. JoHANN, S. J. New York: Herder and Herder, 1968. Pp. $4.50.

Father Johann proposes a "rebuilding" of the human, both as philosopher and as historian of human thought. Just as a man does not begin from scratch in building a human existence, neither does the author begin from scratch in his musings upon the task. There are strong indications of the influence of H. Richard Neibuhr, John Dewey, John Macmurray and Teilhard de Chardin. The blend is both extremely personal and extremely urbane. And the touch is finally that of a pragmatist in the best sense of the intellectual tradition of Dewey and James.

What Father Johann does, it appears, is to put human thought and activities into a broader context than the context of systematic allegiances. In this Johann is eclectic-except that his eclecticism is reduced by a personal synthesis that is half the result of poetic statement, half the autobiographical insinuation of his personal conviction. Throughout, there is often an unspoken comparison implied in his style: he is frequently describing Neibuhr's Man-the-Responder, but he is always keeping Man-the-Consumer or Man-the-Onlooker on the horizon for contrast's sake.

Building the Human frequently reaches heights of real eloquence, as when comparing thought, feeling and reality. "Feelings are not arbitrary, isolated occurences taking place under our skins. They are the pervasive and unifying qualities of the interactive process between person and environment that is human life itself. Instead of being irrelevant to what is going on, they are its culminating sense.... In relation, then, to reality, feelings are far from frivolous distractions. Instead they are the ultimate qualitative differences in that inclusive transaction which is reality."

And in speaking of love: " Some inkling of love's power can be had by each of us if we but recall those rare and privileged moments when, with sudden splendor, the brightness of love burst into our lives.... We came alive. Possibilities for existing in ways we had forgotten, in ways

that made our past routines appear a barren desert-possibilities that summoned forth a creativity we did not know we had, that infinitely enriched our present by holding up to us a future without bounds-newly quickened our minds and hearts. . . . What *being-loved* makes being do is precisely *be."*

Synthesis for Johann seems to mean not just a theoretical synthesis of insights from many schools; it seems to mean, above all, a synthesis of philosophy and experience. In giving a concrete manifestation of how *he* has done this for himself, philosopher Johann has made the project itself both credible and intelligible.

PAUL PHILIBERT, **O.P.**

Providence College
Providence, R. I.

Der Aggressionstrieb und Das Bose. By WINFRIED CzAPlEWSKI-GEoRG ScHERER. Essen: Driewer, 1967. Pp.

These discussions of the relationship between the human aggressive drive and moral evil represent a philosophical examination of the scientific solution of the same problem as offered by Konrad Lorenz in his *Das Sogenannte Bose- Zur Naturgeschichte der Aggression.* (Transl.: *On Aggression.* Harcourt, Brace and World, Inc.) The authors, the former being an instructor, the latter the director of the Catholic Academy, i.e., the Institute of Adult Education, of the diocese of Essen, W. Germany, consider Lorenz's thesis worthy of a serious, critical confrontation. On the one hand, Konrad Lorenz, who is one of the founders of modern ethology, is widely recognized as an outstanding authority on animal, especially instinctual behavior. The high esteem enjoyed by scientists in our modern society as well as the urgency of the problem of human aggression in an age of East-West ideological and political conflict and of atomic weapons armament favor the spread and acceptance of scientific statements on the nature, origin, and control of aggressive urges. In fact, Lorenz's book became a bestseller with twenty editions in less than three years in German-speaking countries. On the other hand, it seems rather questionable to expect final revelations on specifically human attitudes from " a natural history of aggression," i. e., a scientist's conception of the evolutionary development of aggressive behavior patterns in the animal kingdom. Drs. Czapiewski and Scherer are of the opinion and intend to establish that Lorenz's attempt to reduce the evil in man to an aggressive instinct and its manifestation does not even touch the problem of moral evil but truly deals only with a "so-called evil"; consequently, his hope for the evolution of a defense-mechanism against human aggression can

rightly be considered only as an illusion. In the first part of their book entitled *Das Bose als Aggression?* Dr. Czapiewski presents and evaluates the main ideas of *Das Sogenannte Bose;* in the second part, *Das Nichts und das Bose,* Dr. Scherer offers his phenomenological and metaphysical views of the nature and etiology of moral evil.

Following Lorenz's explanations, Dr. Czapiewski first determines the nature and meaning of aggression, more exactly, of intra-specific aggression, i.e., of the fight between animals of the same species; for this intra-specific aggression alone is of interest to Lorenz in his attempt to diagnose and to cure aggressive behavior among human individuals and societies. Aggression is found to be an instinct. As such it is " a part of the system- and life-preserving organization of all (living) beings" (13); never is its aim the destruction of a member of the species. It is, then, spontaneous, not merely the result of and the response to an external stimulus. In the absence of a connatural stimulus, aggressive behavior will be automatically elicited and directed toward an *Ersatz-object.* The danger for the species which, in the case of aggression, is involved in this spontaneity of the instinct is eliminated in the course of evolution inasmuch as the movements of the intra-specific animal fight become " ritualized " and thus mostly harmless or, at least, only gradually dangerous, and inasmuch as damaging attacks are subject to physiological inhibition.

This type of ritualization of originally aggressive behavior is most evident in that kind of animal society which, according to Lorenz, is characterized by the most severe intra-specific aggression and, at the same time, by a " personal bond " or " the bond of friendship and love." (24) While in more primitive, phylogenetically earlier forms of animal social life, for instance, in " the anonymous flock " or in " the society without love," animals are united only locally or merely temporarily during the mating season in a way that not the individual but merely its role is important, two or more individuals of a species are bound together in personal love in this highest and most perfect of possible social ties. And this bond of friendship and love is manifesting itself in ritualized, re-directed aggressive activity as, for instance, in the " triumph-ceremony " of geese. Stimulated by the female, the gander starts to attack it; inhibiting sign stimuli proceeding from the female redirect the aggression to another object or enforce a mere vacuum activity. After the abreaction of the accumulated aggression, the gander returns to his friends with loud greetings and, together with them, performs the triumph ceremony. The more intensive this joint enthusiastic behavior, the more unshakable will be the bond of personal love uniting the animals. Friendship and love have their origin in intra-specific aggression, and their intensity is correlative with its degree. " There is intra-specific aggression without its antidote, love; but there is no love without aggression." (26)

Human existence is no less subject to instinctual determination than animal life. It is " foolish spiritual pride " to insist upon an essential

difference between beast and man, or to consider man as " the center of the universe" or "as not pertaining to nature." Demanding humility, Lorenz is fighting the " prejudices " concerning our relationship with the animal kingdom and preaching self-recognition which is to result in the insight " that we are of one genus with the animals," " that we are driven by the same instincts as our pre-human ancestors" and "that our deeds and omissions are subject to the laws of natural causality."

Human aggression is the expression of an instinct which is more dangerous than any related animal instinctual endowment, since an intra-specific selection enforced the extreme cultivation of hostile virtues, after the development of intelligence during the early Stone Age allowed the human species to become master of its environment through armament, clothing, and social organization. This over-developed aggression is dangerous, disastrous "evil"; the future of mankind, which increases explosively and produces ever more dangerous weapons, cannot be considered " more optimistically than that of some hostile groups of rats living on a boat almost empty of any food." (38) In fact, the social relations of rats represent " a model for visualizing the dangers threatening ourselves. As far as their attitudes towards members of their own community are concerned, . . . these animals are truly prototypes of all social virtues. However, they turn into genuine brutes, as soon as they have to do with members of another group." (30 f.)

Yet the situation is not hopeless. " Deepening of our insight into the causal chain behind our behavior " and " responsible morals," i.e., a compensation-mechanism automatically adjusting our instinctual endowment with the demands of civilization, may serve to guarantee our survival. Until " the great constructors of the transformation of the species," i. e., mutation and natural selection, (47) finally succeed in developing this compensation-mechanism, we are advised to abreact aggression by turning it to substitute objects. Competition in sports and international dangerous rivalry, for instance, in space flights, are said to be especially helpful, since they also lead to personal acquaintance and thus to the inhibition of aggression. Dr. Czapiewski concludes his report by declaring this profession of hope in the constructors of evolution which, according to Lorenz, are completely blind for the future and achieve their transformations only after millions of years as " a flight into the future conditioned by a failure to face the problems of the presence." (47)

The failure of a realistic confrontation of the problem in question is, as Dr. Czapiewski's critique of Lorenz's reveals, the result of a disregard of the essential difference between animal and man and consequently between instinctual and moral behavior. Lorenz, whose brilliant descriptions of his scientific findings concerning animal life are recognized (Q7), is accused of anthropomorphism in his interpretation of animal behavior and of theremorphism in his understanding of human existence. A falsification of both animal and human life is the result. Essential characteristics of man,

especially the freedom and responsibility of his mature behavior, are not considered. Moral evil which is identified with an instinctual activity is thus not recognized in its genuine nature and importance, and man as an instinctually determined being is absolved from every responsibility for the so-called evil. The basis of Lorenz's misunderstanding of human existence is finally seen in his theory of knowledge which implicitly declares natural science as the only source of truth and denies the need of a universal, philosophical discipline.

Such a philosophical discussion of moral evil is taken up by Dr. Scherer who basically presents the traditional thomistic view of the problem. As the title of his treatise indicates, however, he intends to use a modern approach, and he believes he is able to supply the allegedly required correction of the scholastic metaphysical conception of evil. Thus he justifies the need for a philosophical determination of evil not by a discussion of the nature of the incarnate spirit but by following the speculation of the so-called post-neoscholastic German philosophy of To-be and by considering "evil in the horizon of the *Seinsfrage."* (83) Man's essence is declared " to be determined by the understanding of To-be " (83) and even to be " the being of the anticipation of the Infinite and the Absolute." (90) "Malice is found only with a free being who posits the question of To-be and who touches in To-be the mystery called God." (97)

In a " phenomenology of evil " fl'.) our author, then, attempts to determine the common, basic feature in the manifold appearances of human evil. He sees it in "a turn against being," "in a negation and depotentiation of being," (109) and in "a denial of the assent to To-be." (104) However, the author recognizes that his definition of evil stands in conflict with " the dominion of man over the universe " demanded by reason and revelation, and thus he declares it as applicable primarily to "the proper battlefield of evil," to the intra-human relationships. (111 f.) Further penetration into the phenomenological essence of evil, then, reveals that evil as the negation of being involves, at the same time, a turn "against everything existing, the world as a whole, even against To-be itself." For "every being meets him (man) only, because he reaches out for the hidden To-be itself. It is the horizon and the most inner transcendental condition of his being-in-the-world." With this turn against To-be itself, evil is also a turn against the Infinite Being, since " in every limitation there lies a reference and implication of that which cannot be subject to limits." (89) And finally, evil is a turn against one's own Ego: "in every evil there occurs a self-inflation of the Ego, which at the same time effects his self-destruction and death, because he divorced himself from To-be." (130)

In a chapter entitled *The origins of evil* fl'.) the author discusses various philosophical and religious opinions which, in the course of history, were proposed as a solution of the problem. He establishes that man's

free decision alone can rightly be made responsible for moral evil and that " the thesis concerning evil as a privation proves its clarifying force " against all differing positions. The admission of the great historical merits of the metaphysical determination of evil, however, should not blind us with regard to its shortcomings. According to our author, evil is not sufficiently defined when its phenomenologically determined negativity is understood as a mere privation. The nature of this privation, the evil of the bad will, has to be characterized. It is to be sought in " the turn against being, even the hatred of To-be itself." (174 f.)

After the justification of his philosophy of human evil Dr. Scherer concludes his section of the book with a short discussion of " the human bios and aggression." (24:'3 ff.) He shows that the biological structures involved in human nature and accessible to scientific research are, because of their openness to higher levels of human life, different from those of an animal, and that consequently " nature and reality of man transcend the level of the biological." (246) Accordingly, "the human readiness for aggression does not represent an entity closed in itself." (248) Man is, or at least ought to be, master of his drives and of his destiny.

Obviously this philosophical discussion of evil can stand further clarification and improvement. A critical view of the assertions of the proponents of the modem philosophy of To-be will help to avoid their frequent confusions of being with the mere fact of existence, with the To-be of Heidegger's ontological difference, with this same To-be understood as a quasi-infinite real mediator between God and creature, and with the Infinite Being Himself. It will also recognize that a mere consideration of the ontological difference without the use of causal thinking cannot be truly sufficient for a philosophical defense of the existence of God. Attention to the difference between the scholastic metaphysical doctrine of evil in general and the concept of moral evil, on the one hand, and between evil as such and its concretization in a defective being on the other, could, then, probably satisfy questions concerning alleged defects of the traditional understanding of evil. At any rate, moral evil cannot simply and universally be determined as a hatred of To-be; at least, a clarification and precision of the meaning of both To-be and of hatred are required. Dr. Czapiewski's exposition of Lorenz's ideas is objective and clear, and his critique is justified. However, it should be pointed out that his positive evaluation of the scientific basis of Lorenz's anthropological theories is not generally shared by students of animal behavior.

Such critical remarks are not intended to deny the value of the book. It may be recommended to everybody who is interested in a realistic appraisal of Lorenz's scientific claims concerning the nature and the future of human aggression.

MARCUS SCHNEIDER, O. F. M.

The Catholic University of America
Washington, D. C.

The Refutation of Determinism: An Essay in Philosophical Logic. By M. R. AYERS. New York: Barnes and Noble, 1968. Pp. 179. $6.00.

Readers who approach this volume anticipating a comprehensive discussion of the "free will" problem in terms of standard classical and contemporary formulations are bound to be initially disappointed. For example, scientific determinism, "the view that everything that happens is in principle explicable by reference to its antecedents and laws of nature," (p. 4) is quickly distinguished from metaphysical determinism," the denial of the existence of any free choice," (p. 4) and dismissed. There is no serious discussion of the possible ways in which the latter might depend on the former. Absent also are any discussions of the new twist given to determinist arguments by widespread acceptance of some form of the identity solution to the Mind-Body problem or recent defenses of libertarianism in terms of the now widely mooted view that intentional human actions cannot in principle be causally explained.

What the book does deal with, in exhausting it not exhaustive detail, are the concepts of possibility and potentiality. And a reader who has the fortitude to press on through Ayers's thickets of dense philosophical prose will come to appreciate both the author's remark in the Preface that "perhaps everyone who can think has the concept of possibility, but no one understands it" (p. vii) and his view that clarification of the concepts of possibility and potentiality is a necessary if not a sufficient condition for refuting any deterministic arguments which have genuine implications for human freedom.

The concrete argument of the book proceeds by distinguishing and clarifying three different kinds of non-logical possibility: "epistemic possibility," "natural (empirical) possibility," and "possibility for choice." Ayers's strategy is then to "try to show that the determinist charatceristically confuses different kinds of possibility, and that he misunderstands even the kinds that he recognizes." (p. 11)

The author first attacks the view that the explanation of the notion of personal power (possibility for choice) is grounded in our typical inability to predict actions (epistemic possibility). His primary objection to this thesis is that the truth conditions for statements such as "It is possible *for* Smith to call" and "It is possible *that* Smith will call" are radically distinct. The first represents an "ontological" claim which depends on the facts of Smith's actual condition, while the latter embodies an "epistemic" prediction based on the evidence *actually available* about Smith. Neither statement *entails* the other, for it seems clear that the existence of Smith's capacities does not depend on what we, as a matter of contingent fact, happen to know about them.

This type of argument counts equally against attempts to explain the natural capacities (empirical possibilities) of inanimate objects in terms of

concepts pertaining to what we know about them. "To say that a thing *can* do something is to make no sort of conjecture that it will do it, or, for that matter, that it has done it or is doing it." (p. 40) At the same time, Ayers is anxious to reject any vestige of the idea that talk about the natural powers or capacities of objects commits one to the view that they are hidden or occult *properties.* His own analysis of natural possibility yields the conclusion that "in general, *It is possible for x to be k* means *In some circumstances, x would be k."* (p. 69) It follows from this analysis that supporting claims about natural possibilities is a straightforward matter of gathering relevant inductive and theoretical knowledge.

However, the foregoing definition of natural possibility should not be taken to imply the necessity of giving a purely *conditional* analysis of powers of natural objects. Indeed, Ayers's subsequent "refutation" of determinism turns precisely on this point. For he wants to maintain that neither natural possibility claims nor assertions of possibility for choice can be properly treated as elliptical conditional statements.

In the case of natural possibility the argument amounts to the claim that one must distinguish between intrinsic and extrinsic conditions relevant to the attribution of capacities. The difference is illustrated by the following pair of statements.

(I) This car could do IOO m.p.h., if it had eight cylinders.

(2) This car could do IOO m.p.h., if it were driven properly.

While (I) represents a genuine condition for the *existence* of the capacity to do IOO m.p.h., (2) expresses only a condition for the *actualization* of a potentiality under particular circumstances. Statement (2) expresses a pseudo-conditional, and " a pseudo-conditional ' x can do a, if x is p,' is simply an idiomatic way of asserting not that something is a sufficient condition for the existence of a power but that something is a necessary condition for the actualization of the power which exists." (p. 99) In sum, assertions of natural possibility are not always disguised genuine conditionals: 'p is possible ' does not entail 'p, only if q '.

But how does this argument bear on the crucial question of personal powers or genuine possibility for choice with respect to human agents? In this case too, Ayers argues, explanations in terms of genuine conditionals are doomed to failure. The reason is that the crucial differences noted between statements (I) and (2) above are mirrored in the following statements describing human capacities.

(8) You could hit the target, if you aimed straight at it and pulled the trigger.

{4) You could hit the target, if you wished (chose to, tried).

Only the former is a genuine conditional, according to Ayers. The latter is a pseudo-conditional, on all fours with (2). Deliberations are certainly relevant to questions about what we actually do or shall do, but not to

what we can do. " The question whether a person chooses or wishes to do an action is irrelevant to the question of whether he is able to do it . . . if all I need to do in order to get an apple is to choose to get it, then, categorically, I can get it." (p. 121)

The general character of Ayers's anti-determinist conclusion should now be apparent: " The ultimate verification of attributions of personal power, and of any proposition that some state of the agent or some set of circumstances in which he is placed is a factor determining his ability to do an action, is by reference to trials, that is, successes and failures." (p. 162) To the objection, ' If I do *not* now try to raise my arm, or try to count up to a hundred, how do I know that I can now do these things? ' the answer is platitudinously: by induction. I have done them in circumstances not materially different from the present, and have not failed in doing them except when things were materially different." (pp. 146-47)

Thus far I have been attempting to uncover the barest outlines of the very complex set of arguments in this book. To the extent that these remarks succeed in fairly representing Ayers's fundamental thesis they also make obvious at least one type of objection which must be answered in order to secure the thesis. In this light the important question is, What is to count as a " material difference " in the circumstances of a human agent? If differences in affective and volitional states of the agent are counted as material differences, the argument is open to an obvious determinist objection. On the other hand, if we accept Ayers's argument above that statements like (4) are pseudo-conditionals, it is clear that affective and volitional states cannot be counted as material circumstances. However, the problem posed by *this* alternative is that it permits a new gambit for the determinist. For, in terms of our earlier example, a determinist might grant that it is possible for Smith to call (in the sense of possessing the appropriate abilities) while denying that it is possible that Smith will call (in the sense of empirical or natural possibility), given the truth of some set of relevant laws governing human behavior.

In other words, while it is clear that " p is possible " does not entail "p, if q," it is equally clear that "p is possible" does not entail "p." The *crucial* question however, is whether "pis possible" (in the sense of possibility for choice) might not be compatible with "not p is necessary" (in some sense of empirical necessity), at least in those cases where "p" refers to a human action. I strongly suspect that an affirmative answer to this question can be defended, but substantiating such an answer would involve resolving a number of issues outstanding in the philosophy of mind to which Ayers does not address himself in this volume. Interestingly enough, if the case for such a position could be made out, though Ayers's argument would fail as a refutation of determinism, it could still be defended as a persuasive compatibilist *solution* to the " problem of free will."

In a review of this sort one cannot begin to do justice to all of the subtle and important arguments in this book. However, I have sought to show that, whether or not Ayers has succeeded in refuting determinism, his arguments deserve the careful attention of all serious students of the " free will " problem.

VAUGHN R. McKIM

University of Notre Dame
Notre Dame, Indiana

The Savage Mind. By CLAUDE LEVI-STRAUSS. University of Chicago Press: Chicago, 1966. Pp. with bibliography and index. *$5.95.*

"Magical thought is not to be regarded as a beginning, a rudiment, a sketch, a part of a whole which has not yet materialized. It forms a well-articulated system, and is in this respect independent of that other system which constitutes science. . . . It is therefore better, instead of contrasting magic and science, to compare them as two parallel modes of acquiring knowledge. . . . Both science and magic however require the same sort of mental operations and they differ not so much in kind as in the different types of phenomena to which they are applied." (p. IS) "The savage mind is logical in the same sense and the same fashion as ours, though as our own is only when it is applied to knowledge of a universe in which it recognizes physical and semantic properties simultaneously." (p.

These quotations summarize the major thesis in Claude Levi-Strauss's most recent book, a thesis proposed and defended in an earlier publication, *Totemism,* and here further developed and applied. In essence the thesis contains two propositions, namely, that the characteristics of primitive thinking can be analyzed and defined, and that they are basically similar to the characteristics of the modem scientific mind. The book itself is mainly concerned with the first proposition; it is, in fact, an anthropologist's book devoted almost entirely to the explanation of anthropological data. The second, and more philosophical proposition, is asserted and occasionally deftly supported, but it is not argued systematically.

The characteristics of the savage mind which the author reports and discusses are in the orders of intensity, extension, motivation, acceptance of determinism and logical structure. He finds that primitive people are capable of and typically exhibit exhaustively detailed observation of their environment in both its immediately useful and apparently useless details; they apply themselves intellectually to intense cogitations to classify, order and relate their knowledge in comprehensive systems. They are motivated not merely by immediate needs but by a properly intellectual curiosity and

urge towards finding order and balance in their world. They operate within a framework of strict determinism which demands causal explanations of events. Because of their urge to classify and order, and their deterministic bent of mind, and their curiosity about things not immediately useful, they succeed in making discoveries, and indeed some of the greatest discoveries of the human race date from neolithic times-agriculture, domestication of animals, weaving, pottery, etc.

The logic of the primitive mind is basically a logic of binary oppositions or successive dichotomies (essentially similar to modern taxonomic procedures in botany and zoology), applied to the areas of nature, religion, social institutions and customs, abstractions, etc. These several levels or areas are interconnected by analogies and correlations, so that all thinking and acting is eventually subsumed in a single, all-embracing structure. The modes of association are arbitrary but not incoherent, the system is heterogeneous in content but rigorous in form.

For Levi-Strauss, these are also the essential characteristics of the modern scientific mind, i. e., intense observation of the empirical givens, open-ended curiosity, classification and ordering, acceptance of the rule of determinism. The only difference is that the savage mind applies itself to reality at the perceptual-imaginative level and the scientific mind addresses itself to more abstract levels.

By way of critique of the thesis, there seems to be no reason to object to the proposition that many aspects of mind, especially the most fundamental aspects, are found in savage as well as civilized people. But there seems to be a number of possible objections to the position that these minds do not differ qualitatively. There seems to be good reasons for arguing that the scientific mind operates in ways that the savage mind is incapable of, and that therefore it differs in kind and not only in the materials to which it is applied-not a difference in kind that makes the savage another species of human but a difference in kind like the difference between the child who is sexually undeveloped and therefore incapable of sexual relations and the mature, sexually potent adult.

The cue to the point which Levi-Strauss disregards (or seems to ignore) is contained in what he calls the Neolithic Paradox. "But the fact that modern science dates back only a few centuries raises a problem which ethnologists have not sufficiently pondered. The Naolithic Paradox would be a suitable name for it." (p. 13) "Neolithic, or early historical, man was therefore the heir of a long scientific tradition. However, had he, as well as all his predecessors, been inspired by exactly the same spirit as that of our own time, it would be impossible to understand how he could have come to a halt and how several thousand years of stagnation have intervened between the Neolithic revolution and modern science like a level plain between ascents. There is only one solution to the paradox, namely, that there are two distrinct modes of scientific thought." (p. 15) This

statement appears startling on the face of it; somehow Levi-Strauss evaluates the developments in historical times of mathematics, architecture, political systems, theology, all the branches of philosophy, etc., the contributions, in short, of the ancient Greeks and Romans, the Arabs and Medievals, as "stagnation." Apparently, for him, the human mind reached the limits of its powers as applied to the concrete, phenomenal level of reality around the end of the Neolithic period and then hesitated, baffled until modern times when it found a new level of reality to which it could apply these same powers.

An alternative theory, and one with more support in history and psychology, is that the human mind emerged from the mythologizing, magical state by the discovery of mathematics, i. e., the abstract, and universal realities with necessary, lawful relations underlying the concrete, phenomenal level of nature, and by dint of this insight proceeded into the speculative or philosophical period, in which the search for the universal and necessary reality was the key motivation. Developmental psychologists (see especially Piaget) mark off stages in mental growth which indicate a parallel between the historical development of ideas and the psychological development of the individual's capacity to think. Piaget describes and analyzes in detail the concrete operational phase of mental development (5 years to 11 years) during which the child masters notions of order and relationship and applies them in complex systematizations to the areas of quantity, time, space, movement, etc. He contrasts this period with the later period (adolescence) of formal operations when the youth perceives necessity and contingency, possibility and impossibility, and begins a new phase of exuberant questioning and speculation inspired by these insights.

The modern scientific mind seems to have grown out of the philosophizing mind, as a further stage of development, just as the mature or adult mind grows out of the adolescent mind, and for similar reasons. The limits to what could be done by pure speculation were revealed in history by the irreconcilable conflicts of philosophical systems, on the one hand, and, on the other, the gradually growing realization of the importance of discoveries rising out of and validated by intensive concentration on the empirical. In a somewhat similar way the adult engaged in practical affairs gradually gives priority to facts and evidence over his youthful speculations.

But the scientific mind and the adult mind arc not simply reversions to primitive or childhood thought. The intervention of the speculative period has changed them qualitatively.

The scientific mind is concerned not merely with fitting events into logical structures but in discovering within events the existing structures they suggest and reveal. The scientist is not concerned with a subjectively satisfying systematization of nature, society, religion and thought but with a systematization which can to the greatest possible extent be validated

publicly and objectively. And finally, the scientific mind is explicitly open to the possibility that its formulations can be superseded by better ones, that, in fact, the radical questioning of the axioms of any system of thought is part of the scientific frame of mind-a procedure to which the primitive mind is closed.

MICHAEL STOCK, O.P.

St. Stephen's College
Dover, Mass.

Faith and Violence: Christian Teaching and Practice. By THOMAS MERTON. Notre Dame: University of Notre Dame Press, 1968. Pp. 291. $1.95.

If outstanding theologians find it difficult to explain the morality of man's sexuality in the light of the Gospel and the Church's magisterium, there also exists great mental work to be done to demonstrate and expose the morality of violence. In fact, it appears that those theologians who wish to jettison the traditional teaching of the Church banning contraceptive acts are, for the most part, quite glib either in allowing the use of revolution as a legitimate means for underdeveloped countries to achieve social justice or in supporting the extreme position which proclaims that all war is immoral in the twentieth century. But, to explain the morality of violence in the light of the Gospel and of natural law principles, one must resort to a rigorous examination of the term *violence* and then see its highly analogous role in the spectrum of moral truth. Unfortunately the late and lamented Thomas Merton has not done this task.

From a phenomenological point of view one discovers many violent acts which many societies accept as morally good, e. g., a mother slapping her children when they have done something wrong, boxing, football, medical operations, strikes, the waging of just wars, capital punishment, some types of revolutions, sanctions built into law, mortification of the senses, of the emotions, of the intellect and will. However, these same acts can become immoral under certain conditions; some physically violent acts are always wrong, such as: rape, kidnaping, stealing, murder, and forms of brutality used by persons in authority. Even some contraceptive acts are a kind of physically violent acts which at the same time happen to be immoral.

Violence, then, is a physical evil inflicted upon a person forcing him to act according to another's will and not his own will. Sometimes this may be morally good or evil. But to explain why, the theologian of our time must plunge into the depths of the pyschology of man, the nature of society and government, and grace. In discussing the meaning and scope of

human violence in his latest book, which is a collection of very personal essays, Father Merton does not directly intend to offer a technical treatment of the metaphysical structure of violence. Yet as one reaches the end the book, one cannot but feel that his ideas on violence have failed to harmonize among themselves. We are never quite sure whether the Christian can be for violence or against it.

Praising the non-violent resister Merton says: "... he is fighting for the truth, common to him and to the adversary, the right which is objective and universal. He is fighting for everybody." (p. 15) Yet is it not possible, in principle at least, that the rational use of physical violence also could include the same rationale and even must include it, if the use of violence is to be just?

Speaking about those who cannot have deep interpersonal relationships he writes: " The idea of building peace on a foundation of war and coercion is not incongruous, but it seems perfectly reasonable." (p. Yet can one simply say that coercion and authentic love of society by the ruling body is a necessary contradiction? If so, then the moral legitimacy of sanction built into the structure of law is totally unjustified. It would seem, on the contrary, that some coercion and at least the threat of war to potential invaders would be necessary for imperfect peace within a society.

Merton asserts: "Each one of us has to unlearn an ingrained tendency to violence and to destructive thinking. Each of us has to rid himself of a systematic moral myopia which excuses acts of barbarism when justified by appeals to patriotism and so on. But every time we renounce reason and patience in order to solve a conflict of violence we are side-stepping this great obligation and putting it off." (p. 41) Yet, is there not something good in this tendency to violence and destructive thinking (the irascible appetite of man, no less)? Just as one can call the sexual power evil because man easily goes to excess when expressing it, so also one easily calls man's aggressiveness wrong simply because man tends to excessive expression when his life is being threatened.

About war Merton says: "Actually, of course, political system at present seriously comtemplates abolishing war. All still assume that the only way to peace is to abolish the enemy or reduce him to helplessness." (p. Yet, is it true that all States always assume that only war is the only way of peaee? On the contrary, it would seem that some States use war to solve their problems as the last means when the conference table has not yielded results and all other possibilities have been exhausted. Moreover, it would seem simplistic to hold that all warfare is based simply on the abolition of the enemy, given the witness and testimony of many soldiers of past and present wars.

Merton comments concerning black power, war, and the white power structure of the United States: "... but in the long run the evil root

that has to be dealt with is the root of violence, hatred, poison, cruelty, and greed which is part of the system itself. The job of the white Christian is then partly a job of diagnosis and criticism, a prophetic task of finding and identifying the injustice which keeps war going in order that some might make out of it." (p. H!9) Yet, does not the good root which is likewise part of the " system " also have to be " dealt with "? And may it not be that due to original sin both sides in a legitmately declared war could be right and just, subjectively speaking? While not denying that there is truth to Merton's assertion, yet there is a rather distinct possibility that these faults of human beings are accidental by-products of the system rather than intrinsically bound up with it. How could one conceivably prove that the Vietman war is totally the product of greed, unless he, like God, knew personally the intention of the guiding authority of the power structure?

Earlier in the book Merton speaks about the power structure: " For power can guarantee the interests of some men but it can never foster the good of all men. Power always protects the good of some at the expense of all the others. Only love can attain and preserve the good of all. Any claim to build the security of all on force is a manifest imposture." (p. 23) However, does authentic love exclude the use of some force to attain and preserve the good of the nation? And is it not the case that there are some in society who refuse to give their share to the common good but rather violate it and have very little consideration for the rights of the others? And do not these persons have to be violently forced to cease their activity lest the whole society suffer from their activities?

Reflecting upon non-violence Merton says: " The political failure of liberal non-violence has brought out the stark reality that our society itself is radically violent and that violence is built into its very structure." (p. 144) But, is it not true of all imperfect societies that some injustices inevitably arise, thus giving rise to violence? Why such shock at imperfection as old as man himself?

Reflecting on the war in Vietnam he writes: "In Vietnam the U. S. has officially adopted the policy that the best way to get across an idea is by fire and dynamite." (p. 166) But has it? Is it not certainly a very imperfect human way (not the absolutely most human way) of changing a state of belligerency into a relative, imperfect peace between hostile nations?

Speaking about the nation's attitude to the negro Merton comments: " There is however such a thing as collective responsibility and collective guilt. . . . Few of us have actively and consciously chosen to oppress and mistreat the Negro. But nevertheless we have all more or less acquiesced in and consented to a state of affairs in which the Negro is treated unjustly and in which his unjust treatment is directly or indirectly to the advantage of the people with whom we are in fact identified." (p. 180)

But, if one can make a clear judgment about the collective guilt of a people, then would it not equally follow that populations could be bombed if their military command felt in some way the need of creating or adding to an unjust war?

Finally, Merton directs his attention to decisions made by local churches and the people of said nations in the past deciding whether to cooperate in a war or not: "... Theirs not to reason why. The government knows best. They did not have to inquire too minutely into the cause of war or into the ways by which it was being waged. Suffice it that the bishops by their approval implied that the war and everything about it was just and the bishops in their turn, as good patriots, left all these technicalities to the ministry of war." (p. 195) But, does not an ordinary person untrained in the subtleties of ethical theory rightfully presume that the authorities should have any benefit of the doubt as to the moral uprightness of a war? In such a morass of factors, some of which are totally unknown in order to make a " decision of conscience," how can a philosophically trained individual come to a " certain " conclusion that a war is just or not, if some of the circumstances are totally unknowable unless he is in authority? And does it follow that, if a war is accepted as basically just, all actions necessarily connected with it are judged to be morally good and upright? And does silence on the part of bishops necessarily entail approval for some actions of a war?

I simply refuse to believe that the book of Merton adequately reflects traditional Christian teaching and practice about faith and violence in a perceptively clear manner. Rather, he raises much confusion by his uncritical acceptance of popular theological opinion regarding the Vietnam war, government, black power and the so-called " establishment."

BAsiL CoLE, O. P.

Newman CenteJr
Kentfield, California

Philosophical Perspectives on Punishment. Compiled and edited by EDwARD H. MADDEN, RoLLo HANDY and MARVIN FARBER. Charles C. Thomas: Springfield, Illinois, 1968. Pp. 150.

The problem of punishment presents one of the most baffling aspects of ethical theory, and it is assuredly one of the most intractable elements in penal practice. It can hardly be said that this book, containing as it does the proceedings of a Symposium on Punishment held at the State University of New York at Buffalo, adds greatly to the understanding of the problem or to the resolution of its dilemmas. The four major

addresses-" Philosophy and Wisdom in Punishment and Reward," by Professor C. J. Ducasse; "Immorality, Crime and Treatment," by Professor Charles A. Baylis; " Retribution Revisited," by Professor Bland Blanshard, and " The Contribution of Beccaria, Hegel, Holbach and Livingston to the General Theory of Criminal Responsibility," by Professor Mitchell Franklin-for the most part cover familiar territory, and the commentaries by a variety of philosophers, psychiatrists, social scientists and lawyers reflect very accurately the reactions that can be expected from their respective disciplines. But for the non-specialist, the collection is a convenient source for ascertaining academic opinion on such matters as the grounds of ethical judgment, the distinction between sin and crime, the ambiguities of retributive views, the bases of penal treatment and the limits of the law. It provides besides, a fascinating revelation of the relativity of contemporary moral attitudes.

The Symposium does, of course, raise some fundamental issues, and, unlike many that occupy the professional moral philosopher, they are ones that directly affect the good of the community. It is significant that retribution occupies so prominent a place in the discussion, and Professor Blanshard's paper gives a reasonably argued account of the social sanctions that, properly understood, it should embody. The social scientists and psychiatrists are, as might be expected, more than ready to substitute treatment as an alternative to punishment, and exhibit some naivete in supposing that the causes of crime can so readily be identified with exclusively social and psychological factors. Professor Blanshard does well to remind them that, " under the influence of physical science, we are coming to regard behavior as wholly a matter of physical responses, physically conditioned; there are eminent professors of psychology who are trying to abolish even the reference to an inner life."

When all the argument is over, when teleologists and deontologists have done their best or worst, one may feel that the only adequate ground for a, final vindication of punishment lies in an order that transcends the norms of observable behavior. It is in this sense that retribution can ultimately only belong to God. But in the meantime it might be suggested that the most authentic social science will be one that is consistent with an ethic that is grounded in reason and is declaratory of the true nature and destiny of man. When Hegel affirmed that to punish a man was to pay him the compliment of recognizing his humanity, he was only underlining an insight that lies beyond mere ethical theories of whatever kind. It is in this sense that the retributory element of punishment is finally to be understood. It has as such nothing to do with revenge or the infliction of needless pain. But it is a declaration that man, insofar as he is free and aware of the consequences of his acts, submits himself to the judgment of the society to which he belongs.

What is least encouraging about this Symposium is the contempt-one

can hardly call it less-that is shown for the ordinary graces of verbal communication. Jargon of the most pedantic and unnecessary kind-we hear of " capacitating an entity " and are treated to such hideous terminology as "autotelic" and "heterotelic "-does little to commend the process of philosophical enquiry. Who can be interested in a "punishee" or can want to share in a "concomitant subsumption "? And if French quotations are necessary, then *decourager les autres* is surely what Professor Baylis intends on page 45. *Encourager* is what he says: we hope it is not what he means.

ILLTUD EvANs, O. P.

Saint Albert's College
Oakland, California

The Nature of Philosophical Inquiry. Proceedings of the American Catholic Philosophical Association. Vol. XLI. Washington, D. C.: National Secretariate, Catholic University, 1967. Pp. 273.

This volume contains the addresses, papers and panel discussions for the forty-first annual meeting of the ACPA, March 28-29, 1967, at the Center for Continuing Education, University of Notre Dame, Notre Dame, Ind.

The lively and perceptive presidential address by Ernan McMullin raises the question of the identity and purpose of this group after forty years of organized effort. The founding fathers were fully convinced of the need for a separate group of philosophers sharing a goal and content which they considered both distinctive and worthwhile. They were agreed that they had at their disposal the essential and permanent conceptions and principles which constitute the firm foundation of all philosophy and human science. There may seem to be a gulf, more apparent than real, between such views and those presented at the current meeting. In recent years the philosophy curriculum in Catholic colleges has been undergoing rapid and profound changes, with requirements decreased and both methods and contents broadened, but we are a long way from having a clear picture of what we are trying to do for the under-graduate in philosophy. The sound parts of our tradition should be preserved, and the new methods of analytic philosophy in particular should be more fully employed. New problems such as those of process, subjectivity, and pragmatism must be faced, and cooperation with other philosophers is needed.

The papers and discussions which follow explain various methods of philosophical inquiry and treat of a wide variety of problems according to different methods. Martin C. D'Arcy, who was awarded the Cardinal Spellman-Aquinas medal, considers the immutability of God. Not content

with former explanations which distinguish between the simplicity of the divine perfection and our way of understanding it, he suggests that we have done with the word "necessity " when speaking of God and attribute all to freedom and love.

An Aristotelian view of philosophical inquiry is offered by George P. Klubertanz (St. Louis U.). There are various starting points, goals and methods of elaborating philosophy, and a set of philosophic disciplines. A philosopher should become acquainted with the major options and problems of philosophy, but he cannot pursue all paths that are open to him and so must choose among them. Philosophy is not necessarily pluralistic, but it has developed along many lines which cannot at present be totally unified.

In a comparison between analytic philosophers and metaphysicians, Richard Rorty (Princeton U.) argues that they disagree not so much in matter and method as in the notion of wisdom and how it is to be pursued. Metaphysicians hold that through experience and argument we can attain truth about the ultimately important things, whereas for analysts wisdom is the articulation of a vision based on the sciences and arts. Errol Harris (Northwestern U.) also views metaphysics as related in method and explanation to the sciences and arts but differs from these in scope. Metaphysics is an attempt to organize comprehensively the deliverances of the sciences into a single world view in which all the sciences can be integrated: metaphysics is metascience.

Inquiry is defined by Robert Johann (Loyola Seminary, Shrub Oak) as man's effort to integrate his experience as a responsible agent. It is what the agent does, the operations he performs to meet tension between environmental demands, and the agent's equipment to meet them. The goal of philosophic inquiry is pragmatic: to order and integrate the affairs of every day into something coherent and whole. Agreement among philosophers is difficult to attain because there is no completely objective test for validity of view. Human survival is the minimum requirement, but much depends upon individual bias, and there is no hypothesis with universal appeal.

A special symposium and a section on philosophy and religion deal with relations between philosophy and theology. John Macquarrie (Union Theological Seminary) says that there are probably several ways of doing both philosophy and theology and that existentialism is perhaps the type of philosophy most influential with theologians today, a point contested by the commentator (B. M. Gendreau, Xavier U.). Gerald A. McCool (Loyola Seminary) explores the possibility of a philosophy of Christian experience which would consider the data of revelation insofar as they are accessible to the intentionality of simply being in the world, as distinct from the intentionality of the act of faith.

Several papers and discussions treat of historical and doctrinal aspects

of moral value and ethics, e. g., William B. Hund (Notre Dame} on Franz Brentano, Germain Grisez (Georgetown U.) on methods of ethical inquiry, and Gerard Dalcourt (Seton Hall U.) on natural law theory. In philosophy of nature and philosophical psychology there are papers on motion as conceived in the sixteenth century (William A. Wallace, Dom. House of Studies, Washington), on the evolution of the notion of cause (George A. Blair, Villa Madonna College), and on sensation and perception, with penetrating comments by Theresa Crem (U. of San Francisco). A special symposium treats of Bernard Lonergan's theory of inquiry and its relation to American thought. Here salient questions are raised by the participants and answered by Father Lonergan. Other noteworthy papers treat of Marius Victorinus and his philosophy of the living God (Mother Mary T. Clark) , of the cosmological argument (Peter Bertocci) , and of Heidegger and Thomistic metaphysics (William E. Carlo, Boston College, James F. Anderson, Villanova U.).

This volume shows that the work of the founding fathers is being continued by earnest and broad-minded persons seeking ecumenical contact and understanding between the past and the present in philosophy and religion. There is something here for everyone, and much that is true and good.

WILLIAM H. KANE, O. P.

Aquinas Institute of Philosophy
River Forest, Illinois

New Themes in Christian Philosophy. Edited by RALPH M. MciNERNY. Notre Dame: University of Notre Dame Press, 1968. Pp. 416. $9.50.

Whatever be the outcome of the recurring arguments about the exact relationships between philosophy and the Christian message, there can be no doubt that there has been and will continue to be an interaction between these two vital areas of human thought and activity. The present volume offers seventeen essays designed to " provide a wide-ranging view of today's philosophy which attempting to achieve a coherent picture of what the Church sees through these re-opened windows."

Because these articles are the papers presented at a conference held at the University of Notre Dame in September 1966, they are limited by the range of the purposes of that conference. That the scope is a wide one is clear from the variety of subjects discussed and the differences of outlook presented. No reader will fail to be satisfied by some of the articles or, by the same token, fail to find fault with others. No anthology ever totally suceeds or totally fails. On balance, however, any student of these matters will find the work a useful tool for pointing out the various contemporary trends in thought affecting both philosophical and religious issues.

There are several historical studies that are readable and illuminating·, together with others whose authors seem to have forgotten the advice which warns that the ignorance of history inevitably brings in its wake the repetition of historical errors. Nowhere is the advice more needed than in philosophy and religion where dead horses are dragged out to be beaten again and again. A case in point is the whole area of man's knowledge, particularly on the intellectual level. Notwithstanding the obvious lacunae in our grasp of the total picture, there are many problems here that have been at least partially solved, but the solutions are ignored or forgotten by those who do not know their history.

A number of the articles have appended comments which evaluate, reinforce or perhaps controvert opinions expressed in the articles. These comments are often very helpful in eliminating confusion or tempering undue enthusiasm for some precious opinion. The difficulties of terminology encountered in the writings of thinkers having differing backgrounds is pointed up in several of the comments. This difficulty of terminology makes for muddy writing in which the book abounds. When the commentators who heard the paper are baffled, it is inevitable that readers will be more completely at sea.

After closing the book, two strong impressions remained with me. One was a nostalgic longing for the times when most of those attempting to do philosophy made some use of the fundamental scholastic disciplines having to do with the acts of the mind and modes of knowing, because these make language intelligible, and no contemporary or future gimmick will ever supply their lack. In spite of this, a second impression persisted that this book will be usable for anyone interested in the relations between contemporary philosophy and religion.

GEORGE C. REILLY, O. P.

Dominican HOU8e of Studill8
Washington, D. C.

L'Insegnamento Filosofico nei Seminari dopo Il Vaticano II. Sapienza, vol. XXI, nn. 1-2, 1968.

This is an account of a congress of Italian seminary professors in Naples in December of 1967. It is published as a special January-June 1968 number of *Sapienza.*

I would divide the material of this volume into three classes. A first class deals with what I would call social structure questions of the seminary itself. Thus Professor Poppi describes the insufficient formation of students and professors. (pp. 219-222} Professor Pellegrino demands greater liberty

and legal guarantees of liberty of research for professors. (pp. 133-136) Programs for cooperation of students and faculty with state universities are explained by Fathers Zovatto and D'Amore. (pp. 264-273)

A second class of materials deals with philosophical development but as preconditioned by unbudging adherence to scholastic and particularly Thomistic principles. Here I would place the impressive vast synthesis of modern thought in philosophy and theology proposed by A. Boccanegra, O. P. (pp. 143-205) A third class of materials treats of new problems whose solution is not preconditioned by unbudging adherence to scholastic or Thomistic principles. And in this last class I would place the article of Fr. Gaboriau, O. P., on teaching philosophy (pp. 231-246) and the article by Professor I. Mancini on philosophy of religion. (pp. 94-111)

Fr. Gaboriau, O. P., describes the efforts towards philosophical renewal at the *Mission de France* seminary published as *Nouvelle Initiation.* Its main characteristics are that basic data are taken from a phenomenological search of common speech. From these are elicited the categoric!' and principally that of substance. Substance then becomes the central theme of the rest of the course, and particularly man as substance. Substance and man as substance lead eventually to knowledge of God as Creator. The historical trend from polytheism to monotheism to atheism introduces the problem of God.

Father Gaboriau reports that the course evokes great interest from the students. The teaching method used is that of seminar and discussion groups with appropriate readings along with texts from the *Nouvelle Initiation Philosophique.*

In my opinion, basing the philosophy course on finding the categories is an important step in the right direction. In Gaboriau's brief account of the process, it is not possible to judge how critical is the procedure that he adopts. But being forced to judge from the data of his article without seeing the text of *Nouvelle Initiation Philosophique,* I feel that the problem is too easily settled. Eliciting the categories from contemporary speech was quite licit for Aristotle. But we live in an age where the natural and social sciences and contemporary philosophy present a total understanding of the world without making use of the act-potency categories of substance-accident. In an important sense, these disciplines supply contemporary man with his *basic language* more significantly than does the grammatical structure of daily speech. It seems important then that the clerical student be able to think in this basic language of contemporary man. St. Thomas, Scotus, and Hegel all leave place for a phenomenological understanding of reality prior to the act-potency categories of substance-accident: for they make *being* the *primum cognitum:* and they present non-being, one-many, whole-part correlations as notions immediately following *being* and prior to knowledge of the categories. This permits the *philosophia perennis* to be conjoined to modern science and philosophy. Fr. Boccanegra,

0. P., points up this same conclusion in his article, p. 175, note 84: "This assortment from experience requires no previous analysis of the components intrinsic to experience (act-potency, essence, finite existence, matter-form, substance, accident, etc.) ."

How act-potency analysis in categories of substance, accident, and cause relates to a phenomenological account of experience again comes in question in I. Mancini's *Preposte per Una Filosofia della Religione.* (pp. 94-111) Professor Mancini sees that a merely subjective account of religious experience will not do. On the contrary, in all the great historical religions (p. 100) subjective religious experience has its root in certain foundational events and words ascribed to God Himself. (p. 104) The divine initiative making possible what is impossible to man is religion. (p. 101) For example, these foundational events are the Exodus of the Jews from Egypt, Old Testament prophecy, the Hegira, the Illumination of Budda. (p. 98)

Prof. Mancini's main problem concerns the role philosophy of religion should play respecting these foundational events. Philosophy of religion must accept its religious facts as autonomously posited in history. (p. 98) And it must not reduce these facts to philosophy itself because this would destroy religious facts. (p. Therefore, the stance of philosophy of religion towards religious facts is primarily characterized by a hermeneutical attitude: it seeks merely to interpret religious facts. (p. 108) But this philosophical interpretation does not judge the actual existence of foundational facts themselves but only their possibility, their non-contradictoriness. (p. 99) In order to reach this possibility, it is necessary to have a metaphysics, a creator God-which manifests the ontological depth of creatures. (p. 104) But it is also necessary to show that it is possible according to the general laws of reason and the historical situation of man. (p. 106-107) However, it is impossible for philosophy of religion to go beyond the possibility of such foundational facts so as to judge whether they actually happened, since such judgment is irreducibly subjective. (p. 108) For if the actual religious facts were considered philosophically verifiable facts, it would mean that these facts implied that their contrary (their non-occurrence) were contradictory. (p. 108)

In the discussion that followed his paper, Prof. Pellegrino refused to extend to non-Judaeo-Christian religions the possibility of the foundational facts-events and words of God. For Prof. Pellegrino, these other religions were based only on natural knowledge of the creation of the world by God. Prof. Pellegrino alleged, moreover, that Prof. Mancini was doing a theology rather than a philosophy by the very fact that he was studying the events and works of God in history. In defense against this latter charge, Prof. Mancini pointed to the recent article of the French Catholic theologian **P. J.** Mansir accepting **H.** Doumery's project of writing a philosophy of Christian experience. (p. 111) *(Revue des Sciences Philosophiques et Theologiques,* **LI,** pp. 149-186, esp. p.

Now this writer sees Prof. Mancini introducing metaphysics unnecessarily into discussion of these foundational facts. I am reminded of Garrigou-Lagrange 's *De Revelatione;* it gives an excellent metaphysical account of the *possibility* of miracles for people interested in metaphysics. But its analysis of actual facts is puny and amateurish. Garrigou-Lagrange can be excused on the grounds that phenomenology was not an accepted discipline among Catholics at that time. But that is no longer the case. What prevents us from having a phenomenological description of a number of the miracles of Lourdes? Or miracles studied at the Congregation of Rites? What prevents us from having a phenomenological account of some well-known cases of prophecy, biblical or extra-biblical, whether among Christians or Jews or pagans. Such a phenomenological account could dispense with all act-potency categories of substance-accident and cause. It would suffice to give a critical phenomenological account of these events as basic religious experiences.

Such events and words of God are indeed the foundational religious experiences in all religions. To these events and divine words such as miracles and prophecies subjective religious experience in prayer bears a constant reference. For men pray for interventions in their own lives similar to those the community records as having already occurred. Now St. Augustine had no qualms about attributing prophecy to pagans, e. g., the Cumean Sibyl *(City of God,* book X, chapter XXVII) ; and St. Thomas admitted that God could work a miracle to prove the virginity of a Roman vestal virgin *(De Potentia,* q. 6, art. 5, ad 5um) ; and St. Paul in Titus (1-5' did not hesitate to call prophet a pagan Cretan poet. Cf. also *DTC, Saintete de L'Eglise,* Vol. 14, col. 856-869). Hence the philosopher who is Catholic need have no qualms about readiness to accept prophecies and miracles in pagan religions. And philosophy of religion should recognize that religious experience in prayer within all religions is nourished by community memories of just such occurrences. Thus prophecies and miracles are foundational not only respecting the historic tradition of a given religion but also as nourishing the individual's prayer life. Thus in Acts 14:16, St. Paul sees joy in the heart resulting from good rains and crops as the evidence of God for all nations. But these events are historical events proposed as evidence of God's presence, and they are events similar to the evidence granted to Israel. Spared the metaphysical hurdles concerning the possibility of miracles, this real meat of philosophy of religion would no doubt draw many readers.

Finally, I subscribe to Messrs. Mancini and Mansir in saying that losophy can study such miracles under its own formal light, whether they be biblical or extra-biblical, .Judaeo-Christian or pagan. The difference of formal light safeguards the difference between philosophy and theology from the theologian's standpoint; and as for the philosopher, he wishes to study facts wherever he can find them.

The appeal to radically empirical minds of a critical account of miracles is a well-attested fact. David Hume, the patriarch of modern empiricists, gives a sympathetic account of critically examined evidence for the miracles at the tomb of Abbe Paris. Hume himself knew persons involved in the investigation (Hume, *Philosophical Works* [London, Vol. IV, pp. 101-103, especially note I). Gabriel Marcel says that his whole philosophical life has centered around extra-ordinary phenomena connected with the after-life. (Marcel, *Searchings* [Westminster, 1963], pp. 100 and following). It is well-known how the life work of Alexis Carrell turned around being eyewitness to a Lourdes cure of a dying tubercular patient of his.

The consequent for a philosopher of religion is clear. He should *use his philosophy* to free his phenomenological description from every philosophical category (act-potency analysis into substance-accident and cause). Thus set free by philosophy itself from philosophical structuring of experience, he can give a direct presuppositionless experiential account of foundational religious experience.

RALPH POWELL, O.P.

Aquinas Institute of Philosophy
River Forest, Illinois

Der Begriff "Fleisch" in den paulinischen Hauptbriefen. By ALEXANDER SAND. (Biblische Untersuchungen Regensburg: Pustet, 1967. Pp. 345. Paper DM 45.

The work under review is a doctoral dissertation from the University of Munich. Anyone in the least familiar with Pauline studies will realize the emphasis given anthropology and the importance of such a detailed consideration of the key idea of " flesh " for the thought of Paul. Sand has divided his dissertation into four major sections. The first surveys the history of the problem. The second involves a detailed analysis of the notion of :flesh in the major Pauline epistles. The third considers the meaning of :flesh in the Old Testament and Judaism. The final section deals with a summary of the above and the conclusion.

The first section is an especially valuable one, grouping as it does the various contributions made under three major schools of interpretation. The author concludes the survey by pointing up the various questions which consistently recur in the above survey of the problem: Is Paul's preaching in the context of the Jewish Christian Gospel or does it represent a synthesis of Jewish and Gentile Christianity? When Paul treats of man under the aspect of flesh, where does he get this basic idea? Does Paul understand a certain dualism when he uses the term? What of its relation to his understanding of sin? These and other questions serve as the background of the analysis, which follows.

From the detailed exegesis and interpretation of Paul's use of flesh the author is lead to the conclusion that he does not put forward a " systematic anthropology, nor does he offer a psychology of man as such, of his constituent parts, his nature, his functions." (p. Rather the author concludes that Paul treats of man in various ways, and even when using the central idea of flesh he does not restrict himself to a single meaning. He does, however, always treat of the whole man and in the context of a redemptive-history theology.

The third section provides the background against which the author determines Paul's debt to the thought of the Old Testament and Judaism for his use of flesh, as well as the area in which his meaning diverges. In regard to the latter-flesh as a term for man in slavery to sin and at enmity with God-he insists upon the importance of Paul's Christology and teaching on the Spirit for a proper interpretation of meaning.

In summary, the dissertation is an impressive and imposing piece of work on an important topic. However, certain reservations might be entertained about methodology. The method used by the author is basically the so-called Begriffsforschung-the investigation of the theology contained in a word or group of words. Since .James Barr's resounding criticism of this method in *Semantics of Biblical Language,* one wonders whether the on-going discussion might not relegate such an approach as the author's to a school of the recent past.

JusTIN CuNNINGHAM, **0. P.**

Dominican House of Studies
Washington, D. C.

Jesus and Ethics. By RICHARD H. HIERS. Philadelphia: The Westminster Press, 1968. Pp. *$6.50.*

This book studies the thought of four scholars, Harnack, Schweitzer, Bultmann and Dodd on the relation between the eschatology and ethics of Jesus. By eschatology Hiers means mostly the specific teaching of Jesus that the kingdom of God would be coming visibly, dramatically, and very soon, at which time human history would end. Harnack argues that, although the teaching is in the New Testament, Jesus never took it very seriously and certainly did not make it part of the essence of his doctrine. Schweitzer asserts that Jesus took the teaching very seriously and called for an " interim " ethics until the time would come. Bultmann agrees with Schweitzer that Jesus took the teaching seriously, taught it, and was mistaken about it. The exegete now must demythologize to find an ethical teaching for today. Dodd holds that Jesus preached that the kingdom of God had already come.

Thus, if each man were asked what the relation between the eschatology and the ethics of Jesus is, Harnack would say that there is no relation; Schweitzer that the ethics is a direct result of the eschatology; Bultmann that, since the eschatology is myth, one must go behind it to find the real meaning of existence, namely, radical obedience to the Word of Jesus expressing itself in love of neighbor; Dodd that the ethics flows naturally from a realized eschatology.

Hiers accepts something from all these men but follows the exegesis of Schweitzer and Bultmann mostly. He thinks Dodd is guilty of introducing Platonism into his exegesis by claiming that Jesus was consciously symbolizing in his eschatological teaching an eternal order beyond space and time. Hiers holds that Jesus was simply mistaken about his teaching and taught nothing of the eternal order created by Dodd's platonism.

This, of course, opens up the bag of worms about the identity of Jesus. Hiers skirts the question but seems to give us his own idea about it when he says that God " was incarnate both in the men of faith in ancient Israel and in Jesus of Nazareth." (p. 154) In other words, Hiers would not accept the divinity of Jesus in any unique sense. His criticism of Dodd's position, then, does not allow the possibility that *that* doctrine, not platonism, gave Dodd his basic insight into the preaching of Jesus.

Even if one cannot accept all of Hier's conclusions, the book is a useful summary of the positions of four important scholars on a very sticky problem.

THOMAS R. HEATH, O.P.

Dominican House of Studies
Washington, D. C.

BOOKS RECEIVED

George Braziller, Inc.: *Faith and Politics,* by Reinhold Niebuhr. (Pp. *$6.50)*

Bruce Publishing Co.: *Logic and Scientific Inquiry,* by Paul R. Durbin. (Pp. 132)

Fides Publishers Inc.: *A New Look at Christianity,* by Charles E. Curran. (Pp. *$5.95); Theology Today Series:* I *The Theology of the Incarnation,* by Ralph Woodhall, S. J. (Pp. 95), II *Theology and Revelation,* by Gerald O'Collins, S. J. (Pp. 94), III *The Theology of Faith,* by John Coventry, S. J. (Pp. 93) all *95¢* each; *People. An Anthology of Readings,* selected by Jane Syburg. (Pp. $2.50); *Community Action. A Handbook for Teachers,* by N. Brockman, S.M. & R. Sullivan, S.M. (Pp. 221, $2.95); *Teaching High School Religion through Literature,* by Jane Syburg. (Pp. 72, $1.25); *Let's Talk About Sex. Discussion Program for Parents & Teachers,* by U. G. Steinmetz. (Pp. 248, $2.95); *With Marriage in Mind,* by U. G. Steinmetz. (Pp. 228, *$2.25)*

Friedrich Fromann Verlag: *Commercium Mentis et Corporis,* by Rainer Specht (Pp. 185) 1966.

Harper & Row: *The Faith of the Atheist, by Arthur Gibson.* (Pp. 218, *$5.95)*

Editorial Herder, S. A. (Barcelona): *Theologia Moralis,* by Alphonsus Van Kol, S. J. (vol. I, pp. 824, $17.14; vol. II, pp. 716, $19.28)

Indiana University Press: *William James and Phenomenology,* by Bruce Wilshire. (Pp. 251, $10.50)

Macmillan Company: *Faith and Theology,* by M. D. Chenu, O. P. (Pp. *$6.95); The Non-Violent Cross,* by James W. Douglass. (Pp. 301, $6.95)

Jose Martin-Palma: *Die Seinentfremdung Der Relation Nach Thomas von Aquin,* by Jose Martin-Palma. (Pp. 54)

Newman Press: *Bonhoejjer, The Man and His Work,* by Rene Marie, S. J. (Pp. 141, *$3.95)*

Oxford University Press: *John Knox.* (Pp. *596,* $9.50); *American Catholics and Social Reform. The New Deal Years,* by David J. O'Brien (Pp. 298, $6.50)

Philosophical Library: *The True Priest. The Priesthood as Preached and Practiced by St. Augustine,* by Cardinal Michele Pellegrino. (Pp. 184, $6.00)

Pocket Books, Inc.: *A Marriage Manual for Catholics,* by Dr. William A. Lynch. (Pp. 314, $0.95); *Four Plays By Chekhov,* by Alex Szogyi. (Pp. 298, $0.60)

Prentice-Hall: *The Jerome Biblical Commentary,* ed. by Raymond E. Brown, S. S., Joseph A. Fitzmyer, S. J., Roland E. Murphy, O. Carm. (Pp. 915,

Priory Press: *Christian Spirituality East & West,* by Jordan Aumann, O.P., Thomas Hopko, Donald G. Bloesch. (Pp. *$5.95); Dominican Self-Appraisal in the Light of the Council,* by Valentine Walgrave, O. P. (Pp. 346, $10.00); *Paul and Qumran,* ed. by Jerome Murphy-O'Connor, O. P. (Pp. *$5.95)*

St. Mary's College Press: *Patterns of Promise,* ed. by Christian Brothers. (Pp. $3.60)

Sheed & Ward: *The Cosmic Christ, From Paul to Teilhard,* by George A. Maloney, S. J. (Pp. 309, $6.95); *Maurice Blondel,* by Jean Lacroix. (Pp. 158, *God: the Future of Man,* by Ed. Schillebeeckx. (Pp. $4.95)

Silver Burdett Co.: *Life, Love, Joy* I. Teacher's Manual, by Sr. Janaan Manternach, O. S. F. & Rev. C. J. Pfeifer, S. J. (Pp. 154)

Tulane University Press: *Epistemology* I. Tulane Studies in Philosophy, vol. XVII. (Pp.

University of Kansas Dept. of Phil.: *The Systematic Unity of Value,.* by J. N. Findlay. (Pp.

University of Minnesota Press: *Geometry and Chronometry in Philosophical Perspective,* by Adolf Grunbaum. (Pp. 378, $10.50 cloth, *$3.45* paper)

University of Notre Dame Press: *The Bond of Marriage,* ed. by William W. Bassett. (Pp. $6.95); *Psychotherapy and Religion,* by Josef Rudin. (Pp. *$5.95)*

University of Washington Press: *The Concept of Order,* ed. by Paul G. Kuntz. (Pp. *515,*

Vanderbilt University Press: *The Freedom of Man in Myth,* by Kees W. Bolle. (Pp. $5.00)

Westminster Press: *Icon and Pulpit. The Protestant-Orthodox Encounter,* by Carnegie Samuel Calian. (Pp. $6.50)

THE GENERAL INDEX TO THE THOMIST VOL. XXXIII (1969)

INDEX OF AUTHORS

INDEX OF BOOK REVIEWS

INDEX OF ARTICLES