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## Concept, Process, and Reality

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## Concept, Process, and Reality

It is taken for granted that Thomistic doctrine can neither assimilate, nor account for, one of the most fundamental ideas of philosophy, which modern thought, since Nicholas of Cusa, has set in bold relief: the idea of process extended to otherwise irreducible natures. Most modern philosophers would agree with the late Ernst Cassirer's statement of our problem:

Aristotle's logic is unexcelled in the precise working out of contradictions, in setting up the categories by which the classes of being are distinguished. But it is unable to overcome this opposition between the various classes of being; it does not press on to their real point of unification. Hence it remains caught in the empirical and the finite; it is unable to rise to a truly speculative interpretation of the universe. The physical universe of Aristotle is dominated by the opposition between "the straight" and "the curved"; motion in straight lines and motion in circles are for him essentially and radically distinct. But the transition to the infinitely large and the infinitely small shows that this is a matter not of an absolute but of a relative distinction. The circle with an infinite radius coincides with the straight line; the infinitely small arc is indistinguishable from its chord<sup>1</sup>.

If the unification referred to by the author were understood as accomplished identity, there could be no compromise. For, at infinity, straight would have to be, in the same respect, non-straight. We are not concerned, at present, with the philosophers who accept this contradiction. We merely wish to point out that the irrevocable opposition between the two conceptions illustrated by the passage quoted from Cassirer arises only when we cease to understand "at infinity" as the limit of unending process. While the convergent series is fixed once and for all by a definite law which holds for all possible values of the series, a smallest or a greatest possible value is impossible; nor is the limit itself a possible value. The very law precludes this possibility; for what it guarantees is convergence toward, not attainment of, the limit. Nor could the law be fixed and definite as it is if the variable and the limit were not irreducibly distinct, or if there were a smallest possible difference to keep them apart. At first glance, this qualification might be interpreted as a rejection of the very idea of process associated with formally distinct natures; yet I venture the opinion that the very idea of process depends upon it.

No one will deny that the definition of a term as the limit of a process is a decisive achievement, however well this term may already be known in itself. Not only does it bring out an otherwise unknown relatedness of formally distinct natures: it also implies a peculiar unity in the very *mode of knowing* the one and the other. In fact, it is precisely because we naturally seek a more unified mode of knowing that, when faced with natures related as variable and limit, we are urged to "press on to their real point of unification." But the problem is: does the tendency toward unification in the mode of knowing arise from an actual identity of the objects known?

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1. *Giovanni Pico della Mirandola*, in *Journal of the History of Ideas*, June 1942, Vol. III, n.3, pp.322-323. Permission to quote has kindly been granted by the Publishers.

The problem of the One and the Many is usually confined to the manner in which things in themselves are one and many. Yet there is also a question of a One and Many with regard to the cognitive *means* by which we reach *what* we know. The latter (we shall call it the noetic as opposed to the natural problem) is amply treated by St. Thomas who, in this connection, draws from Platonic, and more particularly from Neo-Platonic sources. His teaching on this subject is as follows<sup>1</sup>. For each object distinctly known we require a distinct means of knowing. Thus, the concept by which we reach the object "circle" is other than that by which we attain "triangle." It is true that both objects may be known simultaneously by some common concept such as that of figure, but the genus "figure" cannot represent them distinctly. Whenever, by means of one concept, we actually consider many objects, we inevitably do so at the expense of distinction. In fact, distinct knowledge requires in us a multitude of cognitive means directly proportioned to the multitude of objects we know. This dispersion of our means of knowing is due to the empirical nature of our mind. Any finite intellect, knowing things in its own mode, requires a manifold of intelligible species, but the number of species, the extent to which the intellect is broken up and scattered about within itself, will be in proportion to its specific degree of perfection. Thus, if our mind were of a more exalted nature, a single concept such as figure might well represent simultaneously the several irreducible kinds of figure with even sharper distinction than that attainable by separate concepts used in succession. Indeed, the Divine Intellect knows all things by means of the single intelligible species which is Its indivisible Essence. — The general concept by which distinct objects are known in confusion only, is called universal in predication ("secundum praedicationem"), whereas the intelligible species which represents distinct objects in their very distinction is said to be of universal power ("universalis virtute," akin to Cassirer's "concrete universality")<sup>2</sup>.

Now let us see how we might apply this doctrine to the problem of reduction by process. Why should we attempt any reduction of formally distinct natures at all? Why not rest in their essential and radical distinction?

Whatever is first and more easily known may be called "more rational to us," whereas that which is known only by further application may be termed "less rational to us." Yet, what is relatively irrational to us may be more rational in itself, such as that proper and formal distinction of things which requires the formation, through experience, construction or inference, of new and distinct concepts to be used in time-producing succession. Hence, the formal distinction of natures, requiring as it does restricted and separate means of knowing, takes on the appearance of an irrational gap between natures. Thus the irreducible givenness of objects, the distinction between straight and curve, polygon and circle, one and

1. E.g. *Contra Gentes*, II, cc.98-101; *Super Librum de Causis*, lect.10.

2. ERNST CASSIRER, *Substance and Function*, The Open Court, Chicago 1923, chap.1, p.19.

two, continuum and discrete, is conceived as a break, as an obstruction, to full understanding. And so it is, if by full understanding we mean a simultaneous, undivided and yet more penetrating view of such natures. However, this irrationality may be tentatively cleared by the insertion of convergent series, for, whenever we can define a notion as the limit of a variable containing it in inchoation, as it were, we somehow overcome the givenness of that notion: it is as if, from the notion of "curve," we were moving toward, and about to reach, that of "straight" in its very difference, without dependence upon the distinct concept of "straight." Could this process be carried through to the end, our mind would be freed from the meshes of its conceptual network. The mere desire to grasp more thoroughly even the objects we already know, would rouse us to seek them in the light of process wherever the interpolation of infinity<sup>1</sup> and movement could afford a "nexus" — to use Cusanus' term.

Yet if, *per impossibile*, this tentative rationalization could be carried through to identity, the universe, as the author of *Identité et réalité*<sup>2</sup> insisted, would collapse into the absolute irrationality of contradiction. It is precisely the irreducible distinctions we have called "irrational gaps" which ensure, at the same time, the rationality of natures<sup>3</sup>. Otherwise, as Henri Poincaré has said, all of mathematics—where we find the first, direct and most complete illustration of process—would turn out to be but a roundabout way of saying that A is A<sup>4</sup>.

1. AS J. MARÉCHAL, S.J., reminds us in his *Précis d'histoire de la philosophie moderne*: «La position de Leibniz devant l'idée d'infini a ceci de particulier qu'il ne rejette pas simplement cette idée dans la zone de l'irrationnel ou du métarationnel (comme les Anciens), mais lui fait une place positive dans le cadre de la raison, sans toutefois supposer l'infini connaissable en lui-même par une idée intuitive, claire et distincte (à la manière des cartésiens). C'est du côté du fini, que l'infini se laisse pressentir et jusqu'à un certain point qualifier par nous; ainsi capté, dans un geste d'approche plutôt que dans une vue, il se révèle le fond constitutif et le principe d'intelligibilité du fini . . .» — Louvain, Museum Lessianum, 1933, t.1, ch.7, n.103, p.128.

2. EMILE MEYERSON, more particularly in his *Essay on La notion de l'identique*, in *Essais*, Preface by LOUIS DE BROGLIE, Paris, Vrin, 1936, pp.187-208.

3. LOUIS DE BROGLIE, distinguished physicist and close friend of Meyerson, summarizes this view as follows: «. . . En montrant cette tendance instinctive de notre raison, le grand philosophe en soulignait hardiment le caractère paradoxal, car l'effort identificateur de la raison, s'il pouvait complètement réussir, aboutirait à l'abolition de toute diversité et de toute hétérogénéité, c'est-à-dire à une espèce de négation du monde même qu'il cherche à expliquer. Et si la raison parvient néanmoins à s'échapper de ce cercle vicieux et à constituer une science qui incontestablement progresse, c'est, pense-t-il, qu'elle laisse se glisser dans nos constructions théoriques quelques éléments irrationnels dont l'introduction plus ou moins subreptice permet à l'ensemble de nos identifications successives de ne pas constituer seulement une immense tautologie. . . . Cette situation se trouve résumée par une phrase de M. Paul Valéry, phrase sans doute inspirée par la lecture même des ouvrages de M. Meyerson: 'L'esprit humain est absurde par ce qu'il cherche; il est grand par ce qu'il trouve'. Mais, comme en définitive l'univers ne peut pas se réduire à une vaste tautologie, nous devons forcément nous heurter çà et là dans notre description scientifique de la nature à des éléments 'irrationnels' qui résistent à nos tentatives d'identification, l'effort jamais lassé de la raison humaine s'acharnant à circonscrire ces éléments et à en réduire le domaine». — *Matière et lumière*, Paris, Albin Michel, 1937, pp.320, 318.

4. HENRI POINCARÉ, *La Science et l'Hypothèse*, Paris, Flammarion, 1932, pp.9-10.

When viewed in this perspective, Bergson's distinction between analysis and intuition («l'analyse opère sur l'immobile, tandis que l'intuition se place dans la mobilité ou, ce qui revient au même, dans la durée»)<sup>1</sup> becomes quite acceptable. Now, as Hegel had pointed out in this connection, dialectical and speculative reason (understood in the Hegelian sense) presuppose the distinctions of understanding<sup>2</sup>. Or, in other words, what has been called the "Platonic mode" must follow upon the "Aristotelian mode." It is true, then, that «*Philosopher consiste à invertir la direction habituelle du travail de la pensée*»<sup>3</sup>.

Let us suppose for one moment that this procedure could be extended to all objects (the basic postulate of mathematism): its ultimate limit then would be a single means of knowing, a unique intelligible species, a numerical, indivisible "one" in the Platonic sense. Above and free from the multiplicity of finite concepts, this absolute idea would be infinite, all-comprehensive. If the rapprochement between such a limit and the noetic one were believed irrelevant, we might quote from Cassirer:

... Die Idealität der Mathematik hebt den Geist zu seiner höchsten Höhe und bringt ihn zu seiner eigentlichen Vollendung: — sie beseitigt die Schranke, die die mittelalterliche Anschauung zwischen der Natur und dem Geist einerseits, zwischen dem menschlichen und dem göttlichen Intellekt andererseits aufgerichtet hatte<sup>4</sup>.

And Hermann Weyl, discussing the problem of being and possibility, of continuum and discrete, has expressed his

conviction that the origin and the reconciliation of this divergence can lie only in God. The attempt presented by realism to elevate the object to the dignity of absolute being was doomed to fail from the start; as was also the opposite attempt of idealism

1. HENRI BERGSON, *La pensée et le mouvant*, Paris, Alcan, 1934, p.228.

2. HEGEL, *Logic* (Encycl.), W. WALLACE transl., chap.6. — The viewpoint of understanding is also called "Metaphysics." Dialectical materialists now use the latter term in this sense. See, v.g., JOSEPH STALIN's *Dialectical and Historical Materialism*, International Publishers, New York 1940, pp.7ff.

3. BERGSON, *op. cit.*, p.241. — Because Bergson believed that movement, becoming and duration in nature are a true instance of the object of what he called intuition, as opposed to the «concepts fixes» of analysis, the interpretation we put upon this most fundamental idea of his philosophy might seem far-fetched. Yet, immediately following the line just quoted we read: «Cette inversion n'a jamais été pratiquée d'une manière méthodique; mais une histoire approfondie de la pensée humaine montrerait que nous lui devons ce qui s'est fait de plus grand dans les sciences, tout aussi bien que ce qu'il y a de viable en métaphysique. La plus puissante des méthodes d'investigation dont l'esprit humain dispose, l'analyse infinitésimale, est née de cette inversion même. La mathématique moderne est précisément un effort pour substituer au *tout fait* ce qui *se fait*, pour suivre la génération des grandeurs, pour saisir le mouvement, non plus du dehors et dans son résultat étalé, mais du dedans et dans sa tendance à changer, enfin pour adopter la continuité mobile du dessin des choses. Il est vrai qu'elle s'en tient au dessin, n'étant que la science des grandeurs... Il est donc naturel que la métaphysique adopte, pour l'étendre à toutes les qualités, c'est-à-dire à la réalité en général, l'idée génératrice de notre mathématique. Elle ne s'acheminera nullement par là à la mathématique universelle, cette chimère de la philosophie moderne. Bien au contraire, à mesure qu'elle fera plus de chemin, elle rencontrera des objets plus intraduisibles en symboles. Mais elle aura du moins commencé par prendre contact avec la continuité et la mobilité du réel là où ce contact est le plus merveilleusement utilisable. Elle se sera contemplée dans un miroir qui lui renvoie une image très rétrécie sans doute, mais très lumineuse aussi, d'elle-même». — *Op. cit.*, pp.241-43. — What Bergson here calls «métaphysique» is akin to Hegel's speculative reason, and not to understanding.

4. ERNST CASSIRER, *Individuum und Kosmos in der Philosophie der Renaissance*, B. G. Teubner, Leipzig 1927, p.171.



to endow the subject with the same high independence. In mathematics also, partly through its dependence on philosophy, the inclination toward the absolute which is evidently deeply rooted in man has asserted itself<sup>1</sup>.

It is held that Aristotelian logic, resting on the principle of contradiction which excludes a middle third, is a mere logic of the finite and must therefore be essentially invalid where it deals with "the contemplation of the infinite";<sup>2</sup> that "it demands a new mathematical logic based on the coincidence of opposites."<sup>3</sup> Now, coincidence of formally distinct objects does indeed contradict the excluded middle when interpreted as formal identity. However, if we distinguish the One and Many of things from the One and Many of cognitive means, of intelligible species, the formal identity of the concept of "straight" and of the concept of "curved" does not conflict with the excluded middle: a single concept representing simultaneously and indivisibly two or more irreducible natures implies no contradiction, since the known is in the knower according to the mode of the knower. Of course, if the excluded middle were interpreted to mean that any knowledge of distinct natures requires distinct means of knowing, it would be quite false: if by "the opposition between 'the straight' and 'the curved'" were meant the distinction between the concept by which we know "the straight" and that by which we know "the curved," we would unhesitatingly agree "that this is a matter not of an absolute but of a relative distinction" — relative to a given type of intellect. In the identity of a single concept distinctly representing different objects in their difference, not in a contradictory identity of the objects themselves, the ideal of rigor would indeed be achieved<sup>4</sup>.

Whether or not our mind can ever reach such rigor is another matter. But there is no doubt that we tend toward it. Defining a nature as the limit of an unending process we at least approach noetic identity; to use

1. HERMANN WEYL, *The Open World*, New Haven, Yale University Press, 1932, p.68. Permission to quote has kindly been granted by the Publishers.

2. "...Jetzt aber erfolgt eine weit radikalere Scheidung: denn die Aristotelische Logik, die auf dem Satz des ausgeschlossenen Dritten beruht, erweist sich eben damit für Cusanus als eine bloss Logik des Endlichen, muss also immer und notwendig versagen, wo es sich um die Anschauung des Unendlichen handelt." — CASSIRER, *op. cit.*, p.12.

3. "...Daher beruft sich Cusanus, um Sinn und Ziel der *visio intellectualis* zu bezeichnen, nicht sowohl auf die mystische Form der passiven Kontemplation, als er sich vielmehr auf die Mathematik beruft. Sie wird ihm zum eigentlichen, zum einzig wahrhaften und "präzisen" Symbol des spekulativen Denkens und der spekulativen Zusammenschau der Gegensätze. "Nihil certi habemus in nostra scientia nisi nostram mathematicam": wo die Sprache der Mathematik versagt, da gibt es für den menschlichen Geist überhaupt nichts Fassbares und nichts Erkennbares mehr. Wenn die Gotteslehre des Cusanus sich daher von der scholastischen Logik, von der Logik der Gattungsbegriffe, die unter dem Satz des Widerspruchs und des ausgeschlossenen Dritten steht, lossagt, so fordert sie dagegen einen neuen Typus der mathematischen Logik, die die Koinzidenz der Gegensätze nicht ausschliesst, sondern die eben diese Koinzidenz selbst, eben dieses Zusammenfallen des Absolut-Grössten und des Absolut-Kleinsten, als ständiges Prinzip und als notwendiges Vehikel der fortschreitenden Erkenntnis braucht." — *Ibid.*, p.15.

4. On the subject of mathematical rigor we refer to J. PIERPONT's *Mathematical Rigor Past and Present*, in *Bulletin of the American Mathematical Society*, Vol. XXXIV, 1928. The author's conclusion is: "Personally we do not believe that absolute rigor will ever be attained and if a time arrives when this is thought to be the case, it will be a sign that the race of mathematicians has declined" (p.23).

Hermann Weyl's expression: our mind "is open toward the infinite," toward that absolute "which 'is not of this world,' and of which the eye of our consciousness perceives but reflected gleams."<sup>1</sup> However, in consequence of the empirical nature of our mind we can never attain to it by the method we are bound to employ — i.e. the tentative reduction toward identity of formally distinct objects —, since "at infinity" both object and concept would be destroyed. For this reason the tendency toward a limit can be no more than the symbolic expression of the identity found in that perfect concept which we have termed a universal in power.

If by the logic of contradiction we mean the method of considering an object as the limit of a process which, at infinity, would actually involve contradiction; if this logic receives its denomination from what *would* be, and not from what is believed to *be* or to be *possible*, I fail to see wherein it contradicts or escapes the logic based on the principle of contradiction. To recognize that the process of a series converging toward a limit is fixed once and for all by a definite law does not imply that we must accept the existence of an ultimate value identical with the limit; that there *is* an arc identical with its chord. To be valid and universal the law does not have to apply to what is impossible. We should not be led to believe that the present dialectical method proceeds from what is quite the opposite of the principle of contradiction, simply because nothing short of identity could arrest the process, while at the same time this impossible term must be kept in mind<sup>2</sup> if we are not to sacrifice the nature of the process as converging toward a limit.

When we attend to a merely noetic "point of unification" the pursuance of rationalization is no longer seen as leading toward a term which implies contradiction, toward destruction of the universe of specific natures<sup>3</sup>: even if it is impossible for us to attain the noetic identity we pursue, such identity does not in itself involve contradiction. Compared to the unity we approach by imitation, our method is but a toy. Yet, even a toy is a likeness. Perhaps the allegory of the Cave would be more fitting.

1. *Op. cit.*, pp.84, 72.

2. «Ainsi il est indispensable de maintenir fermement, dans l'analyse de la pensée, cette notion de l'identique strict, en dépit de ce que cet identique demeure entièrement inaccessible, que le concept paraisse contradictoire en son essence, et que, bien entendu, en sa pureté, ce concept ne se rencontre nulle part ni dans la pensée commune, ni dans le savoir physique, dans son sens le plus large, ni dans le savoir philosophique, puisque ce que l'on trouve c'est toujours et partout de l'identique partiel». — MEYERSON, *Essais*, p.197.

3. "...Aber eben aus dieser Zerstörung erwächst jetzt um so dringlicher die Aufgabe, die Gesamtordnung des Seins und Geschehens aus der eigenen Kraft und mit den eigenen Mitteln des Intellekts wieder aufzubauen. Der Intellekt muss lernen, sich ohne sinnliche Hilfe und Stütze in seinem eigenen Medium, im freien Aether des Gedankens zu bewegen, um kraft dieser Bewegung der Sinnlichkeit Herr zu werden und sie zu sich emporzuziehen. Dami kehrt sich, verglichen mit der Aristotelisch-scholastischen Physik, die Ordnung der Probleme um. Was für diese als Anfangspunkt galt, das wird jetzt zum End- und Zielpunkte der kosmologischen Betrachtung." — CASSIRER, *op. cit.*, p.188. See also, in connection with the subject of this paper, ALEXANDRE KOYRÉ's sharp presentation of Descartes in *Entretiens sur Descartes*, New York, Brentano's, 1944, as well as JEAN WAHL, *Du rôle de l'idée de l'instant dans la philosophie de Descartes*, Paris, Alcan, 1920.