Paraconsistency and Dialectical Consistency[*]

JINDŘICH ZELENÝ

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In the last two decades, the idea of a "paraconsistent logic" has been advanced and elaborated in several modifications[(1)]. Numerous paraconsistent logical calculi have been constructed which allow the formula "$A \wedge \sim A$" to be true (derivable) under some special conditions and thus tolerate $\vdash (A \wedge \sim A)$ without becoming trivial. Some of the adherents of this new trend in contemporary logic investigate explicitly also its **philosophical** presuppositions and implications. Among other problems, the question of the relationship between the idea of paraconsistency and the traditional and/or contemporary forms of **dialectical** thinking is being examined. This is the question we want to focus on here. It seems to us that in the philosophy of paraconsistency a differentiation can be observed to-day. One of the tendencies, represented by da Costa, Arruda, Quesada, Pena a. o., while assessing highly important philosophical implications of the logic of paraconsistency, insists upon the view that paraconsistency is closely linked with the theory of logical calculi. The philosophizing logicians of this tendency give, as a rule, only modest hypothetical accounts of the relationship between paraconsistency and dialectic. The other tendency, represented by G. Priest a. o., dares to defend vehemently more radical and ambitious assumptions about the philosophical and scientific implications of paraconsistent logic, concerning not only the relation to dialectic, but also the conception of rationality in general.

Let us have a closer critical look at some main claims of the philosophy of paraconsistency from a special point of view, namely, from the point of view of secular (ontopraxeological) dialectic[(2)] which aims at elaborating a theory of modern rationality taking inspiration from Hegel's critique of Kant and Marx's critique of Hegel. Needless to say, no simple reception of any philosophy of the past is able to cope with our contemporary problems of rationality.

The relation between paraconsistency and dialectic in da Costa's and Priest's view.

From the beginning, the construction of paraconsistent logical calculi (hereafter **PL**) was connected with a new approach to set-theoretical and other logical paradoxa which had been discovered within [page 36:] the framework of classical propositional and predicate logic (e. g., the logical calculus of Whitehead-Russell's "Principia Mathematica", hereafter **CL**). Instead of eliminating and "pacifying" the paradoxa (e. g. Russell's set)[(3)] by means of restrictive prescriptions and modification of formalism, one decided now to recognize the paradoxical character of some statements, expressed by "$A \wedge \sim A$", as something positive, acceptable as it is, and to adjust the logical calculus so that the trivialization be avoided. In his pioneering paper "On the theory of inconsistent formal system"[(4)] da Costa mentions three conditions which have to be met by the construction of his kind of **PL**:

> 1) The principle of contradiction, expressed as $\sim (A \wedge \sim A)$ should not in general be valid.

2) From two contradictory formulas, *A* and ~*A*, it should not be possible in general to deduce an arbitrary formula.

3) **PL** calculus must contain the schemata and deduction rules of the classical propositional calculus that do not interfere with the first two conditions.

These three conditions show, on the one side, the depth of change (something unbelievable: *principium contradictionis* is being given up in a sense), on the other side, the genetic and structural continuity between **CL** and **PL**. Paraconsistent logical calculi may be regarded as an expansion and completion of **CL**, and **CL** as subset of **PL**.

We can see that both **CL** and **PL** move within the calculus-oriented conceptual framework.

[page 37:] Although secondary, nevertheless very attractive for founders of **PL** was from the beginning the chance and hope to use **PL** for formalizing dialectic and making it rigorous.

Indeed, da Costa and others knew very well that there existed diverse conceptions of dialectic and that many adherents take dialectic to be in principle not formalizable. At the same time there have been always also proponents of dialectic who insisted on the possibility of formalization and tried to elaborate its different forms. o these da Costa (with his co-author Wolf) speaks in the paper "Studies in Paraconsistent Logic I: The Dialectical Principle of the Unity of Opposites"[(5)] while raising the question of the relation between **PL** and so-called dialectical logic:

"The study of dialectical logic, on the other hand, is the study of those logics which formalize theories based on the ideas and principles introduced by Hegel and Marx and their followers. Such study intersects that of paraconsistent logic. The two only intersect, and do not coincide (...) As the formal study of paraconsistent logics has not been oriented towards dialectical notions (though the possibility of application in the field of dialectical theory has been envisaged from the start), the formalization of dialectical theories using the mathematical tools of paraconsistent logic may lead to deviations from 'orthodox' dialectical doctrines. For this reason, our study here (and in future essays) only claims a loose fit with the philosophical theories which are our inspiration. On the other hand, given that Hegelian (and Marxist) theories are not frozen into an obligatory orthodoxy, it is open to us in any [page 38:] given case to argue that the deviations suggested by the already existing tools of paraconsistent logic are in fact desirable modifications of dialectical theories. (We shall in fact take this option below)."

The aims of paraconsistent treatment of dialectical notions and procedures are according to da Costa and Wolf rather modest: "We do not intend to found dialectic logic on given formalisms, but only try to make explicit certain 'regularities' of the 'dialectical movement'. Thus, we may throw a new light on dialectical logic."[(6)]6 To illustrate their new approach da Costa and Wolf construct in the quoted paper[(7)] "a formal logic designed to match a particular doctrine in dialectical theory, that of the 'unity of opposites'"

Having a closer look at what the authors understand by a "dialectical unity of opposites", i. e., what they want to formalize by using **PL**, we have to state that they simply accept some of the interpretations of the "unity of opposites" given by Mc Gill and Perry in a paper of 1948[(8)]. From six alternative interpretations given by Mc Gill and

Perry only the last two can be - according to da Costa and Wolf - fruitfully treated by using **PL**. These two are:

"5. In any concrete continuum, whether temporal or non-temporal, there is a middle ground between two contiguous opposite properties *A* and ~*A*,i.e., a stretch of the continuum where it is not true that everything is either *A* or ~*A*.

6. In any concrete continuum, there is a stretch where something is both *A* and ~*A*."

It is clear that here the notion of the dialectical unity of opposites is being restricted to the question of **fringe-cases**. The so-called "dialectical logic", constructed by means of **PL**, appears to be identical with a logic of **vagueness**.[(9)]

We are far from denying or underestimating the theoretical value of a paraconsistent logic of fringe-cases (borderline-cases). However, the question is to be raised whether da Costa and Wolf succeeded - as they claim they did - in formalizing the dialectical principle of the unity of opposites while constructing "a dialectical paraconsistent logic"[(10)] in the shape of a logic of vagueness. And also the second question: whether this reduction of the notion of the dialectical unity of opposites to fringe-cases is to be regarded as one of the desirable modifications and corrections of inherited dialectical theories.

Our answer to both these questions will be skeptical. In our view, the notion of the dialectical unity of opposites (= the notion of dialectical contradiction, *dialektischer Widerspruch*) cannot be adequately expressed by the formula $\vdash (A \wedge \sim A)$ understood in the sense of classical logic[(11)]. From $\vdash (A \wedge \sim A)$ it follows that it is independently true that *A* and that is independently true that ~*A*. But this is what the notion of dialectical contradiction denies. Or to put it more precisely: this is not what the notion of dialectical contradiction, which as a primarily ontological notion deals with problems beyond the horizon of logical calculi, is meant to express.

Before articulating these critical ideas in more detail, let us have a look at another account of the relationship between paraconsistent logic and dialectic, namely the one presented by G. Priest a. o. [page 38:] While da Costa offers his so-called "dialectical paraconsistent logic" mainly as a logic of borderline-cases, G. Priest's **PL** begins originally as a "logic of paradox", "paradox-accepting logic". Instead of eliminating logical paradoxes (e.g., the Russell's set) by means of pragmatic, mostly restrictive and rather arbitrary modifications in formalism, one accepts them as "true contradictions"[(12)]. Priest defines true contradiction as "any true statement of the form: **a** and it is not the case that **a**" and calls it "dialetheia". This notion is used by Priest also in describing the processes of the physical and social reality. The author calls his special form of **PL** "dialetheic logical theory" and clarifies its relation to **CL** as follows: "The previous chapters advocate a novel logical theory. ... By implication, they are a sustained attack on the dominant logical theory of our times, the logic of Frege, Russell and their successors, or as it has come to be known, classical logic. It is true that this logic can be seen as a special case of dialetheic logic, and it is therefore subsumed by it. None the less, the claims to universality of classical logic must be rejected."[(13)]

So far Priest's version of a paraconsistent paradox-accepting logic can be understood merely as a new approach to the treatment of logical paradoxa - these

isolated islands in the ocean of the calculus-bound consistent deduction - and assessed critically in comparison and completion with other attempts of treating logical paradoxa, e. g., by Lowenheim-Skolem, Martin a. o.

However, Priest himself ascribes to his idea of **PL** greater philosophical competence and ambitions. He uses his idea of paraconsistency for a reinterpretation of the whole tradition of dialectical thinking. From this point of view, he calls Heraclitus the first paraconsistent western thinker[(14)]. Priest and Routley express Heraclitus' view that not-being is not less than being, by calculus-bound formula "$A \wedge \sim A$" and interpret it as a "dialetheia". It seems to us that herewith the content of Heraclitus' idea is distorted. It is arguable that Heraclitus took his idea of the inseparable unity and opposition of being and not-being not to be a paradoxon, but the most fundamental and general characterization of the mode of being of the world. Among the preserved fragments there is none showing that Heraclitus recognized besides true (and only true) statements and besides false (and only false) statements other statements (dialetheias) which were simultaneously true and false and could be expressed paraconsistently now by the formula "$A \wedge \sim A$". Therefore, it seems to us doubtful to subsume Heraclitus' ideas under Priest's notion of paraconsistency.[(15)]

Another example of Priest's questionable attempt to throw new light on some important stages of dialectical thinking in the past by using his expanded notion of paraconsistency and dialetheia is his treatment of Kant's antinomies and their critique by Hegel. It seems to us that here also Priest is applying his calculus-bound notions of inconsistency and paraconsistency to philosophical arguments which have different presuppositions and often also a different sense. More about Kant's antinomies from the point of view of dialectical consistency will be found in the second part of this paper. Here I want to restrict myself to the remark that speaking of Kant and Hegel, Priest seems to be rather [page 39:] vague and ambiguous in their evaluation. On the one side he insists: "It is the main claim of this book that Hegel was right: our concepts, or some of them anyway, are inconsistent, and produce dialetheias."[(16)] In similar spirit Priest ascribes an important place in his history of paraconsistency[(17)] to the so-called "Kant/Hegel thesis that Reason is inherently, by its very nature, inconsistent". On the other side he claims: "I cannot accept any other of the examples which Hegel cites or produces (with the possible exception of one of Zeno's paradoxes...)."[(18)] Therefore: "There is nothing to be gained by an appeal to Hegel."[(19)]

References to Kant and Hegel remain mostly mere decoration. Priest's use of the calculus-oriented notion of inconsistency in his interpretation of the so-called Kant/Hegel thesis about the inherently inconsistent nature of human reason seems to us to be misleading. Supposing we accept Kant's argumentation in his "Transcendental Dialectics" as a justification of the statement that our thinking is in its very nature (apparently, but necessarily) inconsistent: then Hegel's critique of Kant's antinomies should be taken as an attempt at a new consistency which corrects the antinomic dialectic of (apparent, but necessary) inconsistency of human reason in a section of its usage. The distum of a unitary "Kant/ Hegel thesis" hides this difference.

Explaining the semantics of his paraconsistent "dialetheic" logic, Priest shows to how large an extent "these conditions are just the familiar ones of classical semantics"[(20)] and that "notions of logical truth and logical consequences can, again, be defined in a standard way".[(21)] He maintains, too, that classical semantics can be taken as a special case of the dialetheic one.[(22)] This is why we can say that Priest's (as well as in another modification da Costa's) **PL** broadens remarkably the calculus-oriented conceptual

framework, but remains essentially within the limits of this (broadened) calculus-oriented conceptual scheme.

It is common to Priest and da Costa that their answer to the question of the relation between paraconsistency and dialectic suffers from a simplifying reduction of the dialectical notions to calculus-bound notions, i. e., from a misinterpretation of dialectical notions. This is why we cannot agree with the claim that **PL** offers a base for formalizing modern dialectic.

From our critical point of view, the question arises of what are the essential features of the dialectical and calculus-bound conceptual schemes respectively. How are they related? How can the calculus-oriented conceptual scheme, including the broadened one, be embedded into the dialectical conceptual scheme?

To avoid misunderstandings: Our criticism of some philosophical interpretations and applications of the idea of paraconsistency is not to underestimate the high theoretical value of constructing and investigating of logical calculi which tolerate the derivability of the formula "$A \wedge \sim A$" without becoming trivial, i.e., without loosing problem-solving ability.[(23)]

From our perspective problems of calculus-bound consistency, inconsistency, and paraconsistency, if dealt with on a philosophical level, can be considered a part (in a sense, a subordinate part) of the problem of the dialectical consistency of truthful thinking. While the notions of consistency, inconsistency and paraconsistency, as used by paraconsistent logicians, are defined on logical calculi only and limited to them, dialectical consistency is a broader notion concerning the integration of [page 40:] manifold ways of acquisition, presentation, and argumentation of true knowledge of its development. The notion of dialectical consistency aims at clarifying the relationship and unity τῶν περὶ τὴν διάνοιαν ἕξεων αἷς ἀληθεύομεν [among the intellectual faculties used in the pursuit of truth] (Aristotle, *An. Post*. 100 b 5-6). Dialectical consistency is not primarily a question of deductive systems - calculi (whether or not all well-formed formulas are derivable after accepting "$A \wedge \sim A$" as valid formula), but a question of a form of rationality with its manifold and diverse ways of acquiring and justifying true knowledge; a question of how we ἀληθεύομεν [pursue truth]. Dialectical consistency requires and includes the formal (calculus-bound) consistency or paraconsistency of logical calculi, but cannot be reduced to them, being an epistemological (not merely a logical) notion, based on the developing ontological investigation of what there is. The "inclusion" mentioned in the preceding sentence depends on and is connected with a stage-like developmental conception of true thinking and differs in character from the set-theoretical inclusion signified by "$\subset$".

Our critical account of da Costa's and Priest's views of dialectic inserts the problems of consistency and paraconsistency into a broader perspective of the question of the forms of rationality. It is remarkable to find out that this is just what one of the outstanding philosophical proponents of **PL**, Miro Quesada, requires in his paper "Paraconsistent Logic: Some Philosophical Issues".[(24)] He says: "...Unless the recent development of logic is focused within the co-ordinates of rationality, it is impossible to appreciate its significance."[(25)] And also: "If we want to understand what is happening in the field of logic, we must inevitably elaborate a new concept of **reason** that will account for the amazing results that deductive theory has reached in the last few years. However, to elaborate a new concept of reason means nothing less than a paradigm shift also in epistemology. We believe this is a road that is already being followed with

growing interest. We feel that this road is the only one that will enable us to recover the vision of the whole towards which all authentic philosophy aims."[(26)]

While there is a good deal of consensus between Quesada's and our approach in this point, what is the difference?

Surely, Quesada is right in assuming that the relation of logical consequence is the **crux** of logical rationality.[(27)] Comparing diverse forms of non-classical logic - the intuitionists, relevant, paraconsistent a. o. - he elucidates the grade of heterodoxy from **CL** and shows convincingly that our knowledge of the relation of logical consequence was considerably deepened in recent years. In his own words: "The importance of paraconsistent logic in the process of evolution of logic towards higher standards of rationality has been very great because it has liberated logicians of an old prejudice: the belief that a contradiction nullifies a theory. .... Logical rationality has widened its horizons."[(28)]

What is, however, questionable in Quesada's account is jumping from **logical** rationality to rationality **in general** without critically reflecting the difference between the part and the whole. He seems to identify, in the last resort, the broadened calculus-oriented rationality with rationality in general. [page 41:] Therefore he seems to be inclined to accept in principle da Costa's paraconsistent reduction of the dialectical conceptual framework to the widened calculus-committed conceptual framework. To put it on a more general level: he presupposes - as a last resort - the ontological primacy of the process-less. This might be the background of his criticism of the distinction between pre-dialectical and dialectical forms of thought.[(29)] As one of the main arguments for this position Quesada points out that in da Costa's and Wolf's system of paraconsistent "dialectical logic" mentioned above which includes the **CL** as a subsystem, "the classical and the dialectical logic are united".[(30)] However, this argument loses all its power, if our criticism of da Costa's and Wolf's attempt at constructing a "dialectical logic" in the form of **PL** is sound. In our view, the distinction between the predialectical and dialectical forms of thought remains fundamental for the idea of dialectical consistency as well as for the elaboration of a concept of modern rationality which "will enable us to recover the vision of the whole towards which all authentic philosophy aims" (Quesada).

To provide some grounds for our claims let us take a look at Aristotle's theory of contrariety from the point of view of modern dialectic. The question of the kernel of calculus-bound and dialectical conceptual framework respectively, as well as of their relation, will remain in the focus of our attention. Since we criticized da Costa and Priest for not grasping the dialectical notion of the unity of opposites, we are obliged to articulate positively what is meant by this notion in the modern secular (ontopraxeological) dialectic.

The dialectical notion of the unity of opposites

One if the ways how to elucidate our notion of the dialectical unity of opposites (and the notion of dialectical consistency) may be a critical commentary on Aristotle's theory of contrariety (opposition).

In a broaden sense, Aristotle's notion of contrariety (ἐναντίωσιϛ ἐναντιότηϛ) is synonymous with his notion of opposition (ἀντίθεσιϛ), and correspondingly ἐναντία (contraries) is synonymous with ἀντικείμενα (opposites). Thus "contrary" used loosely means "opposite". In a

narrower sense, contrariety is meant to designate only one from the four kinds of opposition, viz. an opposition having an intermediate (μεταξύ).

The passages where Aristotle most fully presents with some small variations his conception of the kinds of opposition are the following: **Categories**, ch.10-11; **Metaphysics**,Book 5, ch.10; **Metaphysics**, Book 10, ch. 3-7.

There are four kinds of opposition,
1. of relatives (ὡς τὰ πρός τι)
2. of contraries (ὡς τὰ ἐναντία)
[page 42:]
3. of possession and privation (ὡς στέρησις καὶ ἕξις)
4. of affirmation and negation (ὡς κατάφασις καὶ ἀπόφασις)

The last one is and detailed account of what Aristotle calls ANTIFASIS is to be found in **Metaphysics** Book 4. Aristotle's examples of the four kinds of opposites are:

1. 'double' and 'half'
2. 'bad' and 'good'
3. 'blindness' and 'sight'
4. 'he sits' and 'he does not sit'

Aristotle was deeply interested in investigating the modes of opposition ( ) and their ontological relevance in the early, middle and late period of his philosophizing. He ascribed to the opposites an important role in almost all fields of reality, in Nature, in society as well as in thought, but disagreed with that ontological overestimation of the role of opposites which he found in many preceding Greek thinkers. Thus in Met 1075 a 28-31 we read: "Now all thinkers posit all things as coming from contraries. But neither 'all things' nor 'from contraries' is right. Nor do these thinkers say, of things to which contraries belong, how those things are composed from contraries; for contraries cannot be acted upon by each other."(31)

There are passages where Aristotle seems to accept the maximization of the ontological role of opposites. So in Met 1004 b 27-30: "Again, one of the two columns of contraries is a privation, and all objects are referred to being and not-being, and to unity and plurality; for example, rest is referred to unity, motion to plurality."(32) However, it is not certain whether these last views are his own or merely a summary of the views of some preceding philosophers who were quoted as οἱ τἀναντία λέγοντες [speaking of opposites].

Anyway, the restriction of the ontological relevance of opposites in Aristotle's philosophy has many explicitly stated grounds. First of all, some important entities are without opposites for Aristotle. [This is] so [with] everything which is eternal (ἀίδιον). Also numbers, because everything having an opposition φθείρεται (perishes), numbers do not. Also Met 1059 a 22: αἱ δ΄ἀρχαὶ οὐκ ἐναντίαι [first principles are not contraries].

In general, Aristotle's criticism of the ontological overestimation of opposites by his predecessors results in the statement that "for us, however, the problem is reasonably solved by the positing of a third object".(33) Aristotle's third object is sometimes ἡ ὕλη (the matter), sometimes τὸ ἀίδιον (the eternal), sometimes τὸ ἀνανκαῖον (the necessary), sometimes ἡ οὐσία (the substance).

It is not our intention to enter into a detailed discussion of the existing interpretations of Aristotle's theory of contrariety.[(34)]

We want to restrict ourselves on only one aspect and one special question: How is the notion of dialectical unity of opposites as used in the framework of modern secular dialectic related to Aristotle's kinds of opposition mentioned above ?[(35)]

Although Aristotle implicitly transcends the horizon of his classification of opposites towards a kind of dialectical unity of opposites by some of his conceptions, he does not come to an understanding and explicit formulation of the notion of dialectical unity of opposites mainly for two reasons. [page 43:] The first is his position concerning the relation between the eternal (unperishable) and the perishable. Aristotle tries to clarify this relation - in the last resort - on the basis of the ontological primacy of the eternal (unperishable).

The second is his misinterpretation of Heraclitus in the sense of Protagoras' relativism. Hereby not only the sophistic relativism, but also the Heraclitian anticipations of dialectical ontology were regarded by Aristotle as a tenet which κωλύει τι τῇ ὀιανοίᾳ ὁρίσαι (prevents from determining anything; *i. e.*, trivializes human thinking).[(36)]

Both claims require a detailed justification.

Aristotle's **Metaphysics** insists on the ontological priority of the imperishable (indestructible) many times and in many ways. So e. g. in Met 1050 b 6-7: "What is eternal is prior essentially to what is perishable" (τὰ μὲν γὰρ ἀίδια πρότερα τῇ οὐσίᾳ τῶν φθαρτῶν).

First, [ ] "the Sun and the stars and the whole heaven" (*Met.* 1050 b) [are eternal for Aristotle]. They always exist "in actuality" (ἀεὶ ἐνεργεῖ) in unchanging cyclic movement. This kind of movement is nearest to constancy.

Secondly, imperishable is what Aristotle calls τὸ ἀνθρώπῳ εἶναι [man in general] or τὸ ἵππῳ εἶναι [horse in general], making a difference between this and τὸ τῷδε τῷ ἀνθρώπῳ εἶναι [this man] or τὸ τῷδε τῷ ἵππῳ εἶναι [this horse], respectively. While the individual horse (τὸ τῷδε τῷ ἵππῳ εἶναι) comes [into existence] and ceases to exist, the horse in general (τὸ ἵππῳ εἶναι) is imperishable (ἄφθαρτον). The latter has no genesis, no decline, no movement, being an entity ᾗ οὔτε κίνησις ὑπάχει οὔτε φθορά οὔτε γένεσις (*Met.* 1009 a 37-38) [in which there is absolutely no motion or destruction or generation]. Similarly, *Met.* 1039 b 25-26: οὐ γὰρ γίγνεται τὸ οἰκία εἶναι ἀλλὰ τὸ τῇδε τῇ οἰκίᾳζ [for the essence of house is not generated, but only the essence of *this* house].

It is true that the relation between a perishable individual and an imperishable remains an for Aristotle. Sometimes, e. g. in the early **Categoriae**, the ontological priority of the individual is stressed: the individuals are ὄντως ὄντα and the being of everything else is dependent on the being of the individuals (the first substance). In **Metaphysics**, however, Aristotle's position is nearer to Platonism[(37)]: the unchanging and constant is regarded as god-like and as having ontological priority over the transitional.

There is a permanent wrestling against Plato's exaggerated preference for and separation of the imperishable from the perishable in Aristotle's philosophy. However, a weaker kind of separation and ontological preference for the constant remains in it. In Met 1058 b 28-29 we read: "...The perishable and the imperishable (τὸ φθαρτὸν καὶ τὸ ἄφθαρτον) must be distinct in genus". If two entities differ in genus, they are - for Aristotle - separated in such a way that there is no motion from one to the other.

So far we have sketched Aristotle's view of the relation between the imperishable and the perishable. Now let us carry out an experiment in thought and observe what effect a "small" correction in Aristotle's presupposition will have for the very foundation of ontology. I mean the following [page 44:] correction: Let us assume that Aristotle was mistaken in regarding the Sun and the stars as imperishable. Let us assume, too, that Aristotle was mistaken in regarding as an eternal, unhistorical entity without coming to exist and ceasing to exist. I think that we have good grounds for assuming this. It seems to me that the ontological effect of these corrections would be far-reaching.

The (weakened) Platonist separation of the imperishable from the perishable as well as its ontological preference would have to be removed. In fact, even the notion of the imperishable, if understood, *i. e.,* in absolute separation from the perishable, has to be removed.

"The imperishable" (τὸ ἄφθαρτον) of Aristotle's ontology will be replaced in the new corrected ontology by "the (more) stable", that which remains unchanged in change, and the old Aristotelian opposition of imperishable and perishable will be transformed into the opposition of stable and changing, στάσις and κίνησις, not-perishing and perishing.

But even the imperishable does not disappear totally in the new ontology. It has, of course, to be understood not ἁπλῶς [absolutely], but in inseparable unity with the perishable. To be sure, the objection can be raised that after removing the weakened Platonist separation of the imperishable from the perishable only the perishable really remains, viz. perishable in various degrees, while the imperishable wholly disappears. But this is not the case in the new ontology and the above objection is to be rejected. In fact, if we maximize the perishable ontologically and ascribe to it the "absolute" validity, then the imperishable comes back into our ontology against our intention because the characteristic "everything is perishable" becomes "absolutely" imperishable. Indeed, here the indispensable and inseparable unity and opposition of the two opposites can be clearly seen. Aristotle's claim that "contraries cannot be acted upon by each other" ('ἀπαθῆ γὰρ τὰ ἐναντία ὑπ΄ἀλλήλων --*Met.* 1075 a 30) does not apply here, nor the Aristotelian "opposites nullify each other" (ἐναντία ἀναιρετικὰ ἀλλήλων)[(38)] nor Aristotle's claim that there is no transition between imperishable and perishable because of their being of distinct genus (*Met.* 1058 b), nor Aristotle's tenet "contraries cannot belong to the same simultaneously" (οὐδὲ τἀναντία ἅμα ὑπάρχειν ἐνδέχεται τῷ αὐτῷ -*Met.* 1011 b 17). What is right about the relation of two opposite properties of a relatively stable subject, e. g. about black or white paper, healthy or ill man, cannot be validly extended to the mentioned strange relation of opposites in the field of ontology, if this ontology is to be constructed consequently as based on the fundamental historization (= processuality) of entities.

Can the suggested correction of Aristotle's ontology be grasped by the slogan? It depends. If one understands πάντα ῥει [everything flows, or changes] as the total negation and removal of constancy, the answer to our question has to be: by no means. If it is to grasp adequately the suggested correction of Aristotle's ontology, πάντα ῥει has to be conceived as "being (= proceeding) in inseparable unity and opposition of opposites", namely of the opposites "stable" and "changing", "rest" and "motion", "being" and "not-being", "unity" and "plurality" a. o. If our immanent criticism of Aristotle's ontology is right, cannot be characterized ἁπλῶς, μοναχῶς (*Met.* 1012 a) [absolutely, in one way], but only by unities of uniting and [page 45:] opposing some most general characteristics. Hereby neither determination of the opposed two, used absolutely,

separately, without indispensably and constitutively implying the opposite, characterizes the investigated mode of being adequately. To proceed in grasping in thought ἴδια πάθη τοῦ ὄντος ᾗ ὄν (*Met.* 1004 b - loosely: the ultimate nature of reality), it is required to think the constant and variable, the being and not-being, the unity and plurality in inseparable unity and opposition. The latter "and" is [a different kind of] conjunction than "&" of the **CL**.

We see that the interpretation of πάντα ῥεῖ [everything flows], which allegedly wholly removes the opposition of imperishable and perishable in favor of the perishable (plus the opposition of rest and motion in favor of mere motion without rest) is to be rejected.

Let us not forget that the above reflections proceed on a very high level of philosophical abstraction which Aristotle's calls "first philosophy" and defined as the investigations into "being qua being and what belongs essentially to it" (*Met.* 1003 a 21). If an analogy with the structure of Kant's "Critique of Pure Reason" is allowed: the above reflections do not deal immediately with the forms of thought investigated by Kant in the part of "Critique of Pure Reason" entitled "Transcendental Analytic" - by abbreviation: do not immediately deal with "analytical" forms of thought.[(39)] They deal with what might be called "trans-analytical' forms of thought, with the area investigated by Kant unsuccessfully, but in a highly stimulating way in the part "Transcendental Dialectic". (Notions examined by Kant in the "Annex" to "Transcendental Analytic" entitled "Von der Amphibolie der Reflexionsbegriffe" [On the Amphiboly of the Concepts of Reflection] have to be added, since they are too, in a sense, trans-analytic). In other words, the above reflections concern the foundations of "analytical" forms of thought. While in his "Transcendental Dialectic" Kant "donne la raison qui interdit de raisonner sur le fondement du raisonnement" (Lyotard) [gives reason which forbids reasoning on the foundation of reasoning], the modern secular dialectic claims to have here in this area a positive, though never definitive say. It operates in the field of enquiries into 'le fondement du raisonnement analytique' [foundation of analytical reasoning]. And interesting problem of the relation between analyticity (in the defined sense), antinomicity and dialecticity arises in this respect and will require separate attention.

Does the new corrected ontology comply with Aristotle's principle of contradiction as explained in Book 4 of **Metaphysics**? The answer cannot be simply "yes" or simply "no". Lukasiewicz[(40)] showed convincingly that Aristotle formulates his principle of contradiction in a three-fold way, as an ontological, logical, and psychological tenet, without making explicit the difference among them. Moreover, both the ontological and the logical formulations appear in various versions.

What seems to be very clearly acceptable on the basis of the new ontology, is the logical (propositional) formulation that "contradictory propositions (i.e., propositions of which one affirms what the other denies - J. Z.) are not true simultaneously"(τὸ μὴ εἶναι ἀληθεῖς ἅμα τὰς ἀντικειμένας φάσεις --*Met*. 1011 b 13-14). The problem of logical paradox is a special case which cannot be generalized.

Aristotle is right in insisting that the denial of this principle would lead to a kind of total trivialization of human thinking and people would become prisoners of a helpless tenet "which prevents a thing from being made definite by thought"(κωλύοντός τι τῇ διανοίᾳ --*Met*. 1009 a 4). [page 46:] Now let us compare three following allegedly synonymous formulations. Aristotle took all three as stating the same principle and in different places mutually argues the truth of each of them from the presupposed evidence of each of them.

1. Met 1001 b 13-14: "contradictory propositions are not true simultaneously".

2. Met 1007 b 18: "contradictories cannot be predicated at the same time" (ἀδύνατον ἅμα κατηγορεῖσθαι τὰς αντιφάσεις)

3. Met 1005 b 26-27: "contraries cannot at the same time belong to the same subject" (μὴ ἐνδέχεται ἅμα ὑπάρχειν τῷ αὐτῷ τάναντία).

The first statement is, as already mentioned, acceptable and respected on the new ontology. The second would be unacceptable if interpreted in the following way: ἀντίφασις (in the European tradition translated as "contradictio") is for Aristotle sometimes the conjunction of two sentences (or statements, propositions) of which one affirms what the other denies; sometimes either part of this conjunction; sometimes the negation of any given subject, property, relation, action etc. (e. g. man - not-man, changing - unchanging).

Let us take the last meaning of ἀντίφασις (contradictio) and remember what has been said about the indispensable, inseparable unity and opposition of unchanging and changing, imperishable and perishable in the corrected ontology.

After removing the (weakened) Platonist separation of imperishable and perishable, we have in peculiar, but very strong way to κατηγορεῖν ἅμα τὰς αντιφάσεις, if we want to characterize the fundamental mode of being. Contradictories, expressed by αντιφάσεις, taken in the specified sense, are not only, but also positively constitutive for each other. In a strong sense, they not only can, but in the ontological area under investigation **have to be** κατηγορούμενα ἅμα περὶ τοῦ αὐτοῦ.

It can be similarly argued about the statement: 3. "contraries cannot at the same time belong to the same object" if taken, as Aristotle did, as a general principle valid for all entities.

Some of Heraclitus' views can be regarded as rudimentary anticipation of what we call here the new corrected ontology. His view that being does not exist more than not-being[(41)] may be interpreted as stating the inseparable and mutually constitutive nexus between positive and negative, being and not-being, and correcting in this way legitimately the Parmenidian "only being exists, not-being is not". For Heraclitus, opposites, and even contradictory opposites, as e. g. being and not-being, are needed to answer the same question which later Plato (*Sophist* 244 a) formulated as: What do you mean when you utter the word 'being'? These opposites are, for Heraclitus, to be taken in unity, as constituting in their opposition and unity something identical. If sometimes in the dialectical tradition Heraclitus' position was characterized as claiming not only the unity, but even the identity of opposites, never was the Leibnizian identity[(42)] meant, allowing us **to replace** one of the identical expressions and/or concepts by the other mutually and thus **to remove** completely the opposition. [page 47:] Heraclitus' main idea about the inseparable unity and opposition of opposites "being" and "not-being" is oriented towards a more complex and more fundamental concept of identity (and, of course, of difference); it is oriented towards a consequently process-like conception of the whole of reality.

If this interpretation of Heraclitus is sound, then what Aristotle says about Heraclitus in connection with the explanation of the "principle of contradiction" in **Metaphysics**, Book 4 is to be regarded as misinterpretation. This concerns the view

that Heraclitus' position, similarly to Protagoras', totally trivializes human thinking, as well as the view that Heraclitus' position eliminates "becoming" (*Met.* 1010 a 35-37). We have tried to show that, on the new ontology, just the opposite is true.

There is, however, a point in Aristotle's criticism of Heraclitus which cannot be seen as misinterpretation. I mean the objection that Heraclitus' position implies necessarily that "everything is relative" (πρός τι ποιεῖν ἅπαντα --*Met.* 1011 b 4). In fact, the Heraclitian position, if elaborated, would necessarily lead to a kind of relativization of entities. In contrast to Protagorian **subjectivistic** relativization, it would be an **objective**, non-relativistic relativization of entities implying the correction of Aristotle's table of categories especially in two points:

- the exaggerated independence and self-sustaining nature of οὐσίαι is to be corrected towards seeing the transitions between one εἶδος and even γένος and another, and
- the Aristotelian degradation and impoverishment of the category "relation' (πρός τι) is to be corrected into recognition of its equal and mutually constitutive position with (devoided of exaggerated independence).

To answer the question "what is the head (of a mammal)" - τί ἐστι ἡ κεφαλή -, we needn't know, **whose** head is in question,[(43)] but we have to investigate and understand the evolutionary connection of the central nervous system of mammals. The notion and the objective entity expressed by "head" become τῶν πρός τι (relatives), without being liquidated in mere relations and without loosing a good deal of self-sustaining nature.

To sum up:

If our presentation of the notion of the dialectical unity of opposites is in fact the kernel of what we call dialectical thinking, then da Costa's et al. claim to have found a way of formalizing dialectical thinking by using the idea of paraconsistency cannot be regarded as successful. It seems more probable that the idea of paraconsistency and the philosophico-logical reflections connected with it will play an important role in a further investigation of the problem mentioned above, i. e., in explaining the relation of analyticity - antinomicity - dialecticity, esp. in elucidating the nature of the middle member (antinomicity).

The problem of dialectical consistency is a problem of a more general and more complex conception of determination than has been that of Aristotle's and that of Kant's and that of Frege's.

[page 48:] In our view, logical and logico-philosophical conceptions based on the idea of paraconsistency widen originally the horizons of logical theories, but remain in the main within the horizon of calculus-bound rationality ("analytical" in the sense suggested above). They legitimatize antinomicity under certain conditions and show the natural positive connection of analyticity and antinomicity. Philosophically, this can be seen as a step forward with respect to Kant.

Provided that the suggested meaning of "analytical" is acceptable, then the calculus-bound conceptual framework (as a kind of analytical one) differs from the dialectical one chiefly in what is common to all kinds of analytical thinking: they do without the notion of dialectical unity of opposites, while the main characteristic of dialectical thinking would be that it operates positively with this notion as ontologically fundamental and indispensable. The peculiar form of analyticity proper to the calculus-

bound conceptual framework is, first of all, implied in the stated definition of the main logical connectives as "∧","~","∨","⊃", or, expressed in term of correlative class-logic, in the definition of the expressions "⊂" and "∈", as well as in the definition of the rule of detachment and rule of substitution (or equivalent rules). The set-theoretical ontology is accepted as an almost unreflected base. We had to go back to Frege, to his horror of historicity in logic and to his conviction that all rationality can be founded on mathematical logic, on the logic of mathematical entities, to discuss this question more fully. This is not to deny the genius of Frege's theoretical initiatives which have been basic for our contemporary development in many areas of theory and practice.

The other point if difference between the analytical (including the calculus-bound) and the dialectical conceptual framework seems to be that the first, if isolated from the second, is hardly able to offer a form of rationality which "will enable us to recover the vision of the whole towards which all authentic philosophy aims" (Quesada); while the second, in co-operation with the first, might be able. (It is probable that the religious answers will not prove, in the long run, satisfactory for autonomous people.)

It seems to us that the philosophy of secular dialectic can propose a concept of modern rationality which will enable us to restore and gradually elaborate in never ending self-criticism "the vision of the whole" as a co-evolutionary unity of mankind and Nature. To the basics of this modern rationality would belong the non-exclusive relation between analytical and dialectical thinking, their developmental unity.

The desirable unifying can be conceived of in various ways. It follows from this paper that we are skeptical about the proposal to unify analytical and dialectical thinking through a kind of reduction of the latter to the first by applying the idea of paraconsistency. It would mean to reduce the whole to a part. What we propose is to conceive analytical thinking as a part of and a derivative from something more complex and more fundamental.

[page 49:] **References**

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[page 50:] **Notes:**

At the XIX World Congress of Philosophy in Moscow 1993 a round table was organized on "Aristotle's Theory of Contrariety and Modern Dialectic:Inconsistency, Paraconsistency, Dialectical Consistency". This is the basic paper offered for the discussion in which Katalin Havas, David Evans, Rychard Wojciski, Miro Quesada a. o. participated. In our view, da Costa's et al. claim to have found a way of formalizing dialectical thinking by using the idea of paraconsistency cannot be regarded as successful. A critical commentary on Aristotle's theory of contrariety (opposition) is used to explain positively our notions of the dialectical unity of opposites and dialectical consistency.

1. See Arruda A.I., *Aspects of the Historical Development of Paraconsistent Logic.* In:Priest et al.,1989.

2. Explained in Zelený 1986.

3. Defined by the following condition: for every x, $x \in r$ if, and only if, $x \notin r$.

4. *Notre Dame Journal of Formal Logic*, 15 (1974), 497-510.

5. In: *Philosophia. Philosophical Quarterly of Israel*, 9 (1980), 190-191.

6. *Ibid*. p. 191.

7. *Ibid*.

8. McGill W. J., Parry W. T.: The Unity of Opposites: a Dialectical Principle. In: **Science and Society**, 12 (1948), 418-444

9. Da Costa, Wolf 1980. p. 215

10. *Ibid*. p. 199.

11. Katalin Havas was right in stressing this point in: *Logic and Dialectic*, Budapest 1989.

12. Priest 1987, p. 4.

13. *Ibid*. p. 257.

14. Priest et al. 1989, p. 5.

15. *Ibid*. p. 141: "The idea of paraconsistency is as simple as it is radical. The fundamental classical postulate that truth and falsehood are mutually exclusive is rejected and replaced by the idea that there may be sentences of a language such that

both they and their negations are true. ...We suppose that some atomic sentences are true (and true only), some false (and false only) and some paradoxical (i.e. both)"

16. Priest 1987, p. 4.

17. *Ibid*. p. 59.

18. *Ibid*. p. 6.

19. *Ibid*.

20. *Ibid*. p. 95.

21. *Ibid*. p. 97.

22. *Ibid*. p. 96: "For classical logic is just the special case where no parameter (and hence no formula) takes the dialetheic value 0,1. All that is wrong with classical semantics for the extensional connectives (and classical logic recognizes no others) is that it 'forgets' this particular case."

23. When Wittgenstein in 1956 noted that in the future people would get free from restrictive postulate of "consistency" it was just the consistency defined on the calculi that he had in mind, as the context of his note suggests.

24. Quesada 1989, pp. 627-652.

25. *Ibid*. p. 644.

26. *Ibid*. p. 646.

27. *Ibid*. p. 645.

28. *Ibid*. p. 644.

29. *Ibid*. p. 643.

30. *Ibid*.

31. As a rule, the English translation of *Metaphysics* by H. G. Apostle (Indiana University Press, Bloomington and London 1966) is quoted.

32. Cf. also *Met.* 1005 a 3-5.

33. *Met*. 1075 a32:
ἡμίν δὲ λύεται τοῦτο εὐλόγως τῷ τρίτον τι εἶναι

34. See Anton, J. P.: 1957, *Aristotle's Theory of Contrariety*, Routledge and Kegan Paul, London. Also Guariglia, O. N.: 1978, *Quellenkritische und logische*

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35. Herewith I try to continue the explanation given in the issue "Der dialektische Widerspruch" in "Europäische Enzyklopädie zu Philosophie und Wissenschaften", vol. 4,pp. 855-866 (ed. by H. J. Sandkühler, Felix Meiner Verlag Hamburg 1990) and in my paper "Parakonsistenz und dialektisches Widerspruchdenken", in: *Dialektik* 1992/1, Felix Meiner Verlag Hamburg, pp. 57-73.

36. Cf. *Met.* 1009 a 4-5.

37. Cf. *Plato Rep.* 477 b.

38. Ammonii in Aristotelis Categorias Commentarius. In: *Commentaria in Aristotelem graeca* IV.I, Berlin 1887, p. 101.

39. This usage of the term "analytical" is, of course, bound not to Kant's dubious distinction between the so-called analytical and synthetic judgments, but to Kant's distinction between "Transcendental Analytic" and "Transcendental Dialectic" within the *Critique of Pure Reason*.

40. Lukasiewicz, J.: *On the Principle of Contradiction in Aristotle*. English transl. in: *The Review of Metaphysics*, 24/1971, 485-509.

41. Cf. Diels H. and Kranz W.: 1961*, Die Fragmente der Vorsokratiker*, 10th ed. Berlin, 22 B 10.

42. Eadem sunt quorum unum potest substitui alteri salva veritate.

43. This is how Aristotle argues the non-relativity of the "head" (*Cat.* 8 b)