Realistic Aspects of Royce's Logic

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REALISTIC ASPECTS OF ROYCE'S LOGIC

THAT ultimately a realistic position is taken in philosophy, even when one attempts the opposite, and that this Realism is not limited to the acceptance alone of an existential world of physical and mental entities, has been, in the writer's opinion, exceedingly well shown by Professor Josiah Royce in an essay with the title, "The Principles of Logic," in the volume entitled, *The Encyclopedia of the Philosophical Sciences: Logic*, 1913. Professor Royce would probably not accept this judgment as to the outcome of his demonstrations. However, that this judgment is correct I shall endeavor to show by quoting and discussing certain paragraphs. Professor Royce's essay will be examined in this way, both because it is a most timely and excellent presentation of recent results in the field of modern logic, and because of what seems to be its bearing on philosophical problems and their solution. The meaning of the passages quoted is not altered by their removal from their context.

The essay is divided into three sections. The last two, making up the greater part of the essay, are (p. 67) "devoted to indicating very summarily, the nature of a doctrine of which the traditional General or Formal Logic is but a part, and, in fact, a very subordinate part. To this doctrine the name 'The Science of Order' may be given. It is a science which is indeed incidentally concerned with the norms of the thinking process. But its character as a normative doctrine is wholly subordinate to other features which make it of the most fundamental importance for philosophy. It is today in a very progressive condition. It is in some notable respects new. It offers inexhaustible opportunities for future progress."

Defining Applied Logic, or Methodology, as that "special and very extended part of 'Logic as a Normative Science' which deals with the norms of thought in their application to the methods used in various special sciences," Professor Royce says: "Methodology, taken in its usual sense as a study of the norms

and methods of thought used in the various arts and sciences, is the mother of logic taken in the other sense hereafter to be expounded. For the undertakings of Methodology lead to certain special problems, such as Plato and Aristotle already began to study, and such as recent inquiry makes more and more manifold and important." "They are problems regarding, *not* the methods by which the thinker succeeds, nor yet the norms of correct thinking viewed as norms, but rather the *Forms*, the *Categories*, the *Types of Order*, which characterize any realm of objects which a thinker has actually succeeded in mastering, or can possibly succeed in mastering, by his methods."

Discussing some of the solutions of the problems of method as they have occurred in the development of philosophy, he cites (p. 71) the view of Plato, that (1) "*The realm of the Universals or 'Ideas' is essentially a System*, whose unity and order are of the first importance for the philosopher; (2) *Inference is possible because truths have momentous objective Relations*, definable precisely in so far as the process of inference is definable; (3) *The 'Order and Connection' of our rational processes*, when we follow right methods, *is a sort of copy of an order and connection which the individual thinker finds, but does not make.* One thus sets out to formulate the right method. One discovers, through this very effort, a new realm—*a realm of types, of forms, of relations.* All these appear to be at least as real as the facts of the physical world. And in Plato's individual opinion they are far more real than the latter."

Professor Royce then says (p. 72): "We are not in the least concerned to estimate in this discussion the correctness or even the historical significance of the Platonic Metaphysic,—a doctrine thus merely suggested. It is enough to note, however, that even if one sets aside as false or as irrelevant all the principal metaphysical conclusions of Plato, one sees that in any case the Methodology of the logician, even in this early stage of the doctrine, inevitably gives rise to the problem as to the relatively objective order and system of those objects of thought to which the methodologist appeals when he formulates his procedure. The Platonic theory of Ideas, Aristotle's later theory of

Forms, the innumerable variations of the Platonic tradition which the subsequent history of thought contains—all these may or may not be of use in formulating a sound metaphysic. But in any case this comes to light: If a logician can indeed formulate any sound method at all, in any generally valid way, he can do so only because certain objects which he considers when he thinks, —be these objects definitions, classes, types, relations, propositions, inferences, numbers, or other 'principles,'—form a more or less orderly system, or group of systems, *whose constitution predetermines the methods that he must use when he thinks.*[1] This system, or these systems, and their constitution, are in some sense more or less objective. That is: What constitutes order, and what makes orderly method possible, is not the product of the thinker's personal and private caprice. Nor can he 'by taking thought' willfully alter the most essential facts and relations upon which his methods depend. If any orderly classification of a general class of objects is possible, then, however subjective the choice of one's principles of classification may be, there is *something* about the general nature of any such order and system of genera and of species,—something which is the same for all thinkers, and which outlasts private caprices and changing selections of objects and of modes of classification."

And again Professor Royce says on the same point (p. 73): "Order is order. System is system. Amidst all the variations of systems and of orders, certain general types and characteristic relations can be traced. If then the methodologist attempts to conduct thinking processes in an orderly way, he inevitably depends upon finding in the objects about which he thinks those features, relations, orderly characters, upon which the very possibility of definite methods depends. Whatever one's metaphysic may be, one must therefore recognize that there is something objective about the Order both of our thoughts and of the things concerning which we think; and one must admit that every successful Methodology depends upon grasping and following some of the traits of this orderly constitution of a realm that is certainly a realm of facts."

[1] Italics mine.

In all these quoted statements Professor Royce seems to the writer to accept very directly and unconditionally the *objectivity*, not only of entities that are ideal and general and abstract, but also of those that are logical. Thus he opposes the dominant and traditional view that logic is 'subjective,' and is, in this sense, the 'art of thinking,' and that the 'laws of thought' are laws of a psychical process.

From the quotations given it would appear that all logic, including the traditional narrow logic of classes and of the syllogism, is objective, and is only one of the several types of order.

There follows, in Professor Royce's essay, an exposition of some of the most important features of The New Logic, especially as this includes 'Order-types.' In these sections such subjects as Relations and their 'Logical Properties,' Classes, Series, the Correlation of Series, Functions, and, finally, 'The Logical Genesis of the Types of Order,' are presented in considerable detail, and the following interesting statements, bearing upon specific points, are made (p. 97): "Relations are of such importance as they are for the theory of order, mainly because, in certain cases, they are subject to exact laws which permit of a wide range of deductive inference. To some of these laws attention must be at once directed. They enable us to classify relations according to various *logical properties. Upon such properties of relations all deductive science depends. The doctrine of the Norms of deductive reasoning is simply the doctrine of these relational properties when they are viewed as lawful characteristics of relations which can guide us in making inferences, and thus Logic as the 'Normative Science' of deductive inference is merely an incidental part of the Theory of Order.*" Thus the *implicative* relation, the progressive discovery or guidance of which is identical with, or accompanies our correct reasoning processes, is held to be objective. Reasoning, as defined in this manner, has its conditions. Did these not subsist, there might still be a 'world,' and this 'world' might be knowable, but we could not reason about it. For, says Professor Royce (p. 107): "Without objects conceived as unique individuals, we can have *no Classes.* Without classes we can, as we have seen, define *no Relations*,

without relations we can have *no Order.   But to be reasonable is to conceive of order-systems, real or ideal.   Therefore, we have an absolute logical need to conceive of individual objects as the elements of our ideal order-systems.*"

With all this, excepting only a seemingly implied dependence of the individuality of 'individuals' upon their being conceived as such, I can agree.   But at this point, as in other places, Professor Royce seems to retract his earlier introductory assertions of the objectivity of the logical situation, and to color these now with an idealistic tinge.   He introduces the thin edge of a wedge for his idealism even more noticeably, but quite as unnecessarily, in the statement (p. 108) that "*A part from some classifying will, our world contains no classes.*"   *One may very well ask, then: How about the class of Wills that classify?   Is this, as a class of individual wills or will-acts that are related and so ordered in a certain way, itself dependent upon a classifying will?*   And, *if not,* may not other classes, and the individuals, the relations, and the order, by virtue of which they subsist as classes, be equally independent of a classifying will, although related to it?

Professor Royce's 'proof' or demonstration that Individual, Relation, and Class are 'the Forms,' or Categories, that " characterize any realm of objects which a thinker has actually succeeded in mastering, or can possibly succeed in mastering," is contained in the Section on "The Logical Genesis of the Types of Order."   His proof is the familiar one of finding that a proposition is 'presupposed by its own denial.'   But in applying this test or criterion he again seems to pass from the earlier acknowledged objectivity of logical entities to a somewhat surreptitious introduction of an idealism that does away with this. Professor Royce's demonstration and the principle on which he makes it can be granted in the specific instance chosen.   But one cannot allow either the limitation of the principle to this instance or the conclusions which he draws from this specific demonstration.   Some of the main points of his demonstration are as follows (p. 131):

" (1) To any 'mode of action,' such as 'to sing' or 'singing' (expressed in English either by the infinitive or by the

present participle of the verb) there corresponds a mode of action, which is the contradictory of the first, for example 'not to sing' or 'not singing.' Thus, in this realm, to every x there corresponds *one*, and essentially *only* one, $\bar{x}$."

" (2) Any pair of modes of action, such for instance as 'singing' and 'dancing,' have their 'logical product,' precisely as classes have a product, and their 'logical sum,' again, precisely as the classes possess a sum. Thus the 'mode of action' expressed by the phrase: 'To sing and to dance' is the logical product of the 'modes of action,' 'to sing' and 'to dance.' The mode of action expressed by the phrase, 'Either to sing or to dance,' is the logical sum of 'to sing' and 'to dance.' These logical operations of addition and multiplication depend upon triadic relations of modes of action, precisely analogous to the triadic relation of classes. So then, to any x and y, in this realm, there correspond xy and $x + y$."

" (3) Between any two modes of action a certain dyadic, transitive and not totally non-symmetrical relation may either obtain or not obtain. This relation may be expressed by the verb 'implies.' It has precisely the same rational properties as the relation $\prec$ of one class or proposition to another. Thus the mode of action expressed by the phrase, 'To sing *and* to dance,'' *implies* the mode of action expressed by the phrase 'to sing.' In other words 'Singing *and* dancing,' implies 'singing.'"

" (4) There is a mode of action which may be symbolized by a o. This mode of action may be expressed in language by the phrase, 'to do nothing,' or 'doing nothing.' There is another mode of action which may be symbolized by 1. This is the mode of action expressed in language by the phrase 'to do something,' that is, to act positively in any way whatever which involves '*not doing nothing*.' The modes of action o and 1 are contradictories each of the other."

Professor Royce finds further (p. 134):

" (1) That the members, elements, or 'modes of action' which constitute this logically necessary system Σ exist in sets both finite and infinite in number, and both in 'dense' series, in 'continuous' series, and in fact in all possible serial types."

"(2) That such systems as the whole number series, the series of the rational numbers, the real numbers, etc., consequently enter into the constitution of this system. The arithmetical continuum, for instance, is a part of the system Σ."

"(3) That this system also includes in its complexities all the types of order which appear to be required by the at present recognized geometrical theories, projective and metrical."

In conclusion, Professor Royce arrives at a position which he calls 'Absolute Pragmatism,' and which he holds. "differs from that of the pragmatists now most in vogue." He says (p. 121): "There are *some* truths that are known to us *not* by virtue of the special successes which this or that hypothesis obtains in particular instances, but by virtue of the fact that *there are certain modes of activity, certain laws of the rational world, which we reinstate and verify, through the very act of attempting to pre-suppose that these modes of activity do not exist, or that these laws are not valid*. Thus, whoever says that there are no classes whatever in his world, inevitably classifies. Whoever asserts that for him there are no real relations, and that, in particular the logical relation between affirmation and denial does not exist, so that for him *yes* means the same as *no*,—on the one hand himself asserts and denies, and so makes the difference between *yes* and *no*, and, on the other hand, asserts the existence of a relational *sameness* even in denying the difference between *yes* and *no*."

" *In brief, whatever actions are such, whatever types of actions are such, whatever results of activity, whatever conceptual constructions are such, that the very act of getting rid of them, or of thinking them away, logically implies their presence, are known to us indeed both empirically and pragmatically; but they are also absolute. And any account which succeeds in telling what they are has absolute truth. Such truth is a ' construction' or ' creation,' for activity determines its nature. It is ' found' for we observe it when we act.*"

With the general tenor of Professor Royce's essay I am in closest sympathy, and it is only to certain restrictions and con-clusions that exception must be taken. One can accept even the specific instance which the application of 'proof by denial'

furnishes, namely, that the 'modes of action' 'to assert' and 'to deny' are themselves instances which conform to and presuppose the logic of classes, of relations, of logical products, of series, etc.   However, to the author of this book this is not proof for the idealistically tinged conclusion, that this logic is in some way created by 'will,' for example, by the will 'to assert' and 'to deny,' or that individuals, classes, relations, order, etc., are in some way dependent on 'will.'   This idealistic tendency is exhibited in the statement, previously quoted, that 'Apart from some classifying will, our world contains no classes.'

Modes of action such as are those of willing, of affirming and denying,—and especially of *finding* that denial presupposes the very thing denied, may indeed present a specific existential case of entities that are individual, are similiar, form classes with sub-classes, have logical products, etc., and form series that are infinite, and either discontinuous, dense, or continuous. *But this does not imply that any of these generic entities as such, or that any instance of them, such as the real numbers, points, and physical objects, is created by 'will,' or dependent on it.*

The ground for this assertion is the generally recognized principle, accepted by Professor Royce himself, that if there is one 'instance,' it is always a permissible hypothesis that there are others.   Perhaps, indeed, 'instance' means or implies just this possibility.   It follows, that, if there is one 'instance,' namely, of acts of 'will' which form *classes, series*, etc., that the possibilities cannot be denied (1) that there are *other instances* of these generic entities, and (2) that *these generic entities themselves* also *are*, that is, *have being*.   However, if there are these possibilities, there are also the further ones, (3) not only that these other instances of individuals, classes, series, etc., may be independent of that particular series which is identical with acts of will, but also (4) that the generic entities, class, series, etc. may be similarly independent.   In fact, this independence of 'other instances' is itself identical with that of the generic entities.   But in any case, even with only the *possibility* implied, that there are *other* instances of series than the will-series, it is logically prohibited to infer the dependence, either of these other

instances, or of the generic entities, *on the will-series itself. The opportunity for their independence is quite as good as for the opposite. Such an independence is quite compatible with a relatedness* of both specific and generic entities *to* will, *to* reasoning, or *to* knowing, and means the *objectivity* both of the general logical entities, class, individual, series, etc., and of all instances of them.

However, one can find not only that this hypothesis of the objectivity of logical entities and principles is permissible and that it is confirmed by empirical investigation, but also that Professor Royce himself really presents no obstacles to its acceptance as confirmed. For the very logical principles which this author himself elucidates and accepts, if they are applied to the specific situation under discussion, themselves demand this conclusion. This can be shown as follows:

Professor Royce makes a number of statements to the effect that 'rational will,' 'modes of action,' 'reasoning,' 'the making of conceptual constructions,' and 'the getting rid of them,' etc., each 'presuppose' or 'logically' imply that logic which is identical with classes of individuals that stand in one or another, or in many, of several relationships, and that form one of the several kinds of series, etc.

Although neither 'presuppose' nor 'imply' is defined by Professor Royce, each of these entities is, by his own logic (at least) a relation. This is the case, first, because the *distinction* is made between the act of 'rational activity' (will to reason, etc.) *and* that which this activity presupposes or logically implies, namely, individuals, classes, etc. 'Presupposer' and 'presupposed' are, then, at least *two*. But, secondly, a relation is defined (p. 96) as "a character that an object possesses as a member of a collection (a pair, a triad, etc.), and which would not belong to that object, were it not such a member." We must conclude, then, that since 'presupposer' and 'presupposed' are two, they are *related*, and that 'presuppose' and 'imply' are the relations present.

The next important question is, Can that which is presupposed or implied be related to, and yet be *independent* of the 'pre-

supposer' or 'implier'? Again Professor Royce gives us the
materials for an answer. In his presentation of the several
classes of relations as dyadic, triadic, symmetrical and non-
symmetrical, transitive and intransitive, etc., he says (p. 99):
"*Transitivity and symmetry are mutually independent relational
characters.*" This independence is then exhibited by finding
instances of the one character *without* the other. Thus the
relation of 'greater than,' symbolized by $>$, is transitive, since,
if $A > B$ and $B > C$, $A > C$; but it is totally non-symmetrical,
since, if $A > B$, this precludes $B > A$. Likewise the relation
'father of' (A is 'father of' B) is also non-symmetrical, yet it
is non-transitive, since, if A is father of B, and B is father of C,
A is precluded from being father of C: the relation 'father of'
does not 'go' from A to C. "Ancestor of' is, however, both
non-symmetrical and transitive. Thus, for example, are sym-
metry and transitivity demonstrated to be, in Professor Royce's
own words, 'independent relational characters.' In any case
by the principles previously stated, since these characters are
two, that is, a pair, they are *related*: and now they are proved to
be *independent*. Therefore it follows, in at least one case, that
relatedness and independence are quite consistent, and co-subsist.

Here again it must be said, that, if there is one instance of such
compatibility, there may be others, and that in no case does
relatedness merely of itself imply, necessitate, or carry with it,
dependence; nor independence, non-relatedness. Just such
another instance, however, may be the important relation, just
discussed, of 'presupposition' or 'implication.' That which
is presupposed or implied, namely the logic of order, etc., may
be related to and yet be *independent* of that which presupposes
or implies it, namely, that very rational activity which Professor
Royce emphasizes so much.

With this the case, one certainly cannot justifiably assert
that (p. 169) "our world contains classes" only because there is
is the will to classify. One cannot in this manner logically
maintain a 'synthetic union' of 'creation' and 'discovery.'

However, in order to confirm empirically this hypothesis, that
independence and relatedness are quite compatible, Professor

Royce himself need only have found, if possible, another class and series of individuals which bears the same relation (that of being 'reviewed') to his own investigating mind as do his own rational modes of action.   Professor Royce discovers in *these,* quite as Descartes found that either to deny or to assert conscious-ness is to presuppose it, *a relation that generates a series.*   He finds that to review a mode of action is itself a mode of action, and implies *its* possible reviewal in another mode of action and so on, in an infinite series.   Further, this series is found to be generated by an asymmetrical transitive relation, and is either discontinuous, dense, or continuous.   However, each member of the series is, as Professor Royce himself admits (p. 153) "dis-tinct," and sooner or later there is *that* member of the series which discovers, or is identical with the discovery of, the serial characters of the whole.   It is shown by the subsequent study of this series, that, if any specific member drop out, especially any so-called first or last member, the series is no less serial or ordered.   The series is both *related* to, and yet *independent* of any member that can thus 'drop out.'   Thus that very serial character of the 'modes of action,' which Professor Royce, in order to support his Idealism, would show is created by and depends upon the 'will to act,' is implied by his own logic to be *independent of that individual act or member in which it is discovered.*

But further, that there are *other series* than the modes of action called 'reviewing,' 'noting,' etc., is also admitted, at least tacitly. For our author accepts and explains at some length the *correlation* of series and the functional relationship.   Then, at least, there must be series to be correlated, say, by a one-one relation, and each series is distinct from the other.   But, related, they are also in their distinctness or bare 'twoness' independent.   For, if there must be at least two entities as the condition for a relation, then this relation cannot in turn generate or condition this *minimum* of diversity.

We thus reach, finally, an important conclusion of direct bearing on the problem of the character of the relationship between 'knowing process' and 'entity known,' whether this be existential or subsistential, generic or specific, concrete or

logical and formal, physical or mental.   First, there are other manifolds than that of the series of rational will-acts.   This is implied by the possibility of series being correlated.   With this the case, there must be at least two series.   But the manifold of will-acts is a series.   Then there must be *other* series with which this is in correlation.   Briefly, we must conclude, that other manifolds *are*, or *have being*, and second, that these other manifolds involve one, some, or all of the logical principles that does the series of rational will-acts.   Third, as 'other than' and numerically distinct from *this* series, these other series are both independent of, and yet related to it, just as the series of one's own rational 'modes of action' (Professor Royce's for example) are both related to, and independent of that specific mode which is the act of discovery.   Finally, there is at least the possibility that all of these ordered manifolds should be related to each other, and yet be distinct, not identical with, and in- dependent of each other.

This four-fold conclusion presents one of the most important parts of that modern logical doctrine which is called Logical Pluralism.   It is the direct opposite of that tendency which Professor Royce supports, at least towards the close of his essay, namely, Logical Monism.   These two positions together center on what is perhaps the most important problem in philosophical methodology, that, namely, of the compatibility of independence and relatedness.   The one answer to this problem, Logical Monism, has, whether it be true or false, conditioned logically the majority of the great orthodox philosophical systems down to the present time.   It is an answer that is itself conditioned historically and psychologically in the Aristotelian tradition. The other answer, Logical Pluralism, has had its forebodings, now and then, also all through philosophical development, but its roots strike deepest into that fertile soil for logical research which is furnished by the relatively recent development of the empirical sciences, including mathematics.   Only of late has this tradition and tendency come, as it were, to self-conscious- ness, and its logic been formulated.   Professor Royce's essay forms a notable contribution to the formulation and emphasis

of the importance of this new logic or 'Science of Order,' as it may be called.   Indeed this long discussion of Professor Royce's essay has been ventured because of its recognition of 'the inexhaustible opportunities for future progress,' both in philosophy and in science, through investigations in this new field.   Not so much along the line of continuing to use the traditional logic, as in philosophizing in accordance with the new logic, is there the possibility of philosophical advance in the future; not so much by studying substance and causation, mere classes, and the relations of exclusion and inclusion, will real problems be solved, as by examining the various types and the properties of relations and series, the correlations of series or functions, and the nature of implication and presupposition.   The one procedure is full of promise; but the other would almost seem to have exhausted its possibilities.

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