Journal of Philosophy, Inc.

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Source: *The Journal of Philosophy*, Vol. 24, No. 5 (Mar. 3, 1927), pp. 120-129
Published by: Journal of Philosophy, Inc.
Stable URL: http://www.jstor.org/stable/2015082
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attain *rapport* with the subject, and the second is the constructive imagination which is able to view in true perspective the whole life career, and the relation of single acts to the total life movement. The third is knowledge of psychological laws, and the fourth is familiarity with historic method in the finding and weighing of evidence. In framing case-histories or biographies these elements of technique must be exercised through a considerable period during which the judgments made must be subject to the criticism of others expert in such work. Similarly, in suggesting methods to be applied to particular cases nothing takes the place of long experience under expert criticism. This view of psychological application alone gives distinctive character to the practical side of the science. The fact seems to be that in the *institutional* applications of psychological principles the best success quite commonly attends the man who is more conversant with the needs of the institution than with the methods of psychological laboratories or with "clinical psychology."

The full force of the argument for narrowing the use of the term "applied psychology" to such personal applications in education and "mental hygiene" and related practise, is evident, however, only as I am able to establish the last cornerstone of the psychological edifice, namely, that *psychology is distinctly normative and ethical,* without losing at all its claims to be a natural science. The argument for this position seems to fly in the face of current opinion and theory, but to me appears quite unescapable. It will be the theme of my third paper, "The Normative in Psychology and in Natural Science Generally."

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A LOGICAL STUDY OF VERBS

THERE is some uncanny property of verbs which seems to set them apart from all other types of grammatical expression; for all other words and word-complexes are used as names of one sort or another, but verbs are certainly not mere names of things, qualities, concepts, or anything else. Infinitives and participles are names for actions; but genuine verbs contain an element that makes them more than substitutive symbols. This "something more" is generally recognized as a special logical function of the verb—the function of assertion. But just in what respect it is logical, has never to my knowledge been explained.[1]

[1] Bertrand Russell in *The Principles of Mathematics* maintains that there is "assertion in a logical as opposed to a psychological sense"; but his defition of it is in terms of truth, which is a metaphysical and not a logical notion. See p. 49.

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That verbs have a psychological force is evident from their indispensability in judgment. Idealists, pragmatists, and laymen proverbially confound propositions with judgments, just as they fail to distinguish between concepts and ideas. But logicians, especially of the mathematical sort, are not supposed to fall into such confusion. For them the verb is not necessarily an index to an act of judging, but a bearer of objective *truth* or *falsity*. The presence of a genuine verb sets the proposition, which is true or false, apart from the propositional concept, which is not.[2] And as truth, or falsity, respectively, belong to the whole proposition, only as a whole proposition, the verb acts as a sort of logical glue—holding the separable elements of the propositional concept together, and making them the inseparable elements of a proposition.[3] There are, then, two unexplained powers of the verb, (*a*) the introduction of truth values, and (*b*) the unification of the proposition.

The first of these peculiarities, if it has any logical basis, should be solved by a careful study in the structures of a proposition and of the analogous propositional concept. This is what Mr. Russell hoped to do in *the Principles of Mathematics:*

> There is the verb in the form which it has as a verb, . . . and there is the verbal noun. . . . By analyzing this difference, the nature and function of the verb will appear."[4]

But, in fact, this function of the verb *qua* verb does not appear; it is *felt*, of course, and can be pointed out, but can not be accounted for, because it seems to depend upon something other than structural difference. All analysis is formal, and in order to name a distinction between "Cæsar died" and "the death of Cæsar" we must discover either a difference of the concepts respectively in-

[2] *Princ. of Math.*, p. 48: "'Cæsar died' and 'the death of Cæsar' will illustrate this point. . . . The death of Cæsar has an external relation to truth or falsehood (as the case may be), whereas 'Cæsar died' in some way or other contains its own truth or falsehood as an element."

[3] *Cf.* Dorothy Wrinch, "On the Nature of Judgment." (*Mind*, N. S., 44): "In a judgment, it is thought that the verb of the proposition must function as a verb and not as an ordinary constituent. Now there is a definite point in this criticism, and in bringing forward any theory of judgment the verb of the proposition must either function in a special way or some answer must be made to this criticism. In the propositional theory of judgment the verb functions in a special way. . . . Functioning as a verb and not as an ordinary constituent means, it appears, acting as a binder. Acting as a binder of certain constituents means making them a unity. Thus . . . the verb binds the elements of the proposition together into a unity."

See also B. Russell, *Princ. of Math.*, p. 50: "A proposition is, in fact, essentially a unity. . . . The verb, when used as a verb, embodies the unity of the proposition."

[4] P. 48.

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volved, or a difference in their determinations by Mr. Russell. Neither in the verb nor in the proposition as a whole do we find other concepts than in the analogous verbal noun and propositional concept.[5] The difference between verbs and verbal nouns, and between propositions and propositional concepts or unasserted propositions[6] appears, then, to be other than a structural difference. And Mr. Russell has drawn this conclusion with perfect frankness:

> There appears to be an ultimate notion of assertion, given by the verb, which is lost as soon as we substitute a verbal noun, and is lost when the proposition in question is made the subject of some other proposition. This does not depend upon grammatical form; for if I say "*Cæsar died* is a proposition," I do not assert that Cæsar did die, and an element which is present in 'Cæsar died' has disappeared. Thus the contradiction which was to have been avoided, of an entity which cannot be made a logical subject, appears to have here become inevitable. This difficulty, which seems to be inherent in the very nature of truth and falsehood, is one with which I do not know how to deal satisfactorily.[7]

In the new edition of *Principia Mathematica* (App. C), he takes up the question once more and attempts to treat the proposition under two aspects, (*a*) as a fact in its own right, and (*b*) as an instrument in the apprehension or conveyance of a fact. In the latter case, the proposition is *used,* but not itself considered; in this sense it is "transparent." It has truth-value, which the proposition as a fact has not.

But to characterize a certain type of proposition—which we may call the "genuine proposition"—by its possession of truth-value is, of course, to drag in a metaphysical notion which must be an unwelcome stranger in the logical field. Yet Mr. Russell has expounded, I think quite conclusively, that between the "proposition as a fact" and the "proposition as a bearer of truth and falsehood" there is no *structural* difference. The difference, whatever it is, must lie somewhere else than in the formal properties of propositions. And this conclusion really puts the question of truth-value, and the closely related problems of meaning and assertion, definitely outside the scope of *Principia Mathematica*; for the material of logic, according to that inimitable classic, is the general forms of proposi-

[5] *Princ. of Math.*, p. 48: "It is plain, to begin with, that the concept which occurs in the verbal noun is the very same as that which occurs as verb. . . . By transforming the verb, as it occurs in a proposition, into a verbal noun, the whole proposition can be turned into a single logical subject, no longer asserted, and no longer containing in itself truth or falsehood. But here, too, there seems to be no possibility of maintaining that the logical subject which results is a different entity from the proposition."

[6] The unasserted proposition is a special case of propositional concept, as I intend to show at the end of this paper.

[7] *Princ. of Math.*, p. 48.

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tion and the relations which obtain between these forms.[8] So the property which distinguishes the "proposition as a fact" from the genuine proposition is inevitably an extra-logical property.

The whole difficulty seems to me to lie in this limitation of logic to the study of *propositional* structures. Such logical problems as the nature of meaning (apart from psychology), the referents of negative propositions, truth, assertion, and related topics remain perfectly insoluble as long as we confine ourselves to the system of propositional forms. But if we allow our logical interest to cover forms of every sort, merely as forms, we shall find that there are innumerable systems, or patterns, in the world, of which the propositional system is merely a special one; that these patterns may be compared, and the systems which exemplify them may be brought into relation with one another, and the traditional "alogical" notions may be brought into the scope of logic as we include not only the relations of elements within one system, but the relations of certain systems to each other (relations such as similarity, analogy, etc.). Josiah Royce defined logic as *the study of types of order.* This is essentially the point of view I wish to advocate, that *logic is the study of forms as such,* regardless of content ("forms" is a somewhat less restricted term than "order").

"Orderliness and system," says Royce in his *Principles of Logic,* "are much the same in their general characters, whether they appear in a Platonic dialogue, or in a modern textbook of botany, or in the commercial conduct of a business firm, or in the arrangement and discipline of an army, or in a legal code, or in a work of art, or even in a dance or in the planning of a dinner. Order is order. System is system. Amidst all the variations of systems and of orders, certain general types and characteristic relations can be traced."[9]

If we treat the system of propositional forms as merely one formal system which may be compared with other logical structures, I think we shall have no need of any particular doctrines about truth, or resort to the psychological phenomenon of belief, to find perfectly definite relations between propositional structures and other structures, which are present whenever we deal with a genuine proposition and absent whenever we have a propositional concept. The apprehension of this relation, the recognition of *similarity* between propositional structures and certain non-propositional structures, is the basis of the "correspondence-theory" of truth and of those doctrines of meaning, the keynote of Ludwig Wittgenstein's

[8] Introd. to the 2d ed.

[9] In Windelband and Ruge, *Encycl. of the Phil. Sciences,* p. 73.

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philosophy, to which Mr. Russell in large measure subscribes. This philosophy really presupposes the less restricted view of logic; but Mr. Wittgenstein's insistence upon taking the "atomic proposition" to be, so to speak, the unit of logical theory, does not allow him to honor as logic what is really his contribution to that subject. That is why meaning and assertion and truth, the essence of Proposition, live in the underworld (or superworld?) of Mysticism. Mysticism has ever been the graveyard for logical doctrines that have met their doom in Contradiction. But let us see whether there is not a resurrection for Mr. Wittgenstein's pet problems in the doctrine of "logical patterns."

Every thing, situation, idea, or what not, has a logical pattern; propositions follow such a pattern, and, as Royce has pointed out in the above quoted passage, all other things, from dialogues to dinners, have patterns of their own. Moreover, there are certain things whose forms correspond in large degree, as for instance the forms of similar series, such as the series of points in space and of moments in time. This correspondence of configuration may be so close that there may be serious doubt whether we are dealing with two analogous series or with an identical one—as, in the cited case, it has been suggested that there is really only one series, that of "point-instants." But we may have various degrees of correspondence. An air-plane view of a place and a topographic map (to use a now hackneyed example) are very similar, but a topographic and a political map of the same place probably coincide only in their larger features; a globe and a navigator's map are still remoter analogues.

It has been stated by Mr. Wittgenstein and elucidated for us by Mr. Russell, that this common element of formal structure is the basis of the meaning-relation; and although it has never to my knowledge been shown that this correspondence of configuration is the logical structure of *all* possible sorts of meaning—denotation, connotation, suggestion, "mnemic causation" or any other sort—it is a fact (for which I hope to produce the proof in the near future) that this *can* be shown, and, consequently, I think we may take Mr. Wittgenstein's somewhat sweeping generalization as, on the whole, a true account. I quote from Mr. Russell's recapitulation in his Introduction:

> In order that a certain sentence should assert a certain fact there must, however the language may be constructed, be something in common between the structure of the sentence and the structure of the fact. This is perhaps the most fundamental thesis of Mr. Wittgenstein's theory. . . . He compares linguistic expression to projection in geometry. A geometrical figure may be projected in many ways: each of these ways corresponds to a different lan-

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guage, but the projective properties of the original figure remain unchanged whichever of these ways may be adopted. These projective properties correspond to that which in his theory the proposition and the fact must have in common, if the proposition is to assert the fact.

Mr. Wittgenstein begins his theory of symbolism with the statement (2.1): 'We make ourselves pictures of facts.' A picture, he says, is a model of reality, and to the objects in the reality correspond the elements of the picture: the picture itself is a fact. The fact that things have a certain relation to each other is represented by the fact that in the picture its elements have a certain relation to one another. . . .

We speak of a logical picture of a reality when we wish to imply only so much resemblance as is essential to its being a picture in any sense, that is to say, when we wish to imply no more than identity of logical form. . . . The sense in which he speaks of a picture is illustrated by his statement: 'The gramophone record, the musical thought, the score, the waves of sound, all stand to each other in that pictorial internal relation which holds between language and the world. To all of them the logical structure is common.'

If now we take, not a fact and a proposition which asserts it, but a fact and the corresponding propositional concept, we find that we have satisfied Mr. Wittgenstein's condition for meaning just as well as though we had dealt with a genuine proposition. Certainly "the death of Cæsar" refers to the same event as "Cæsar died." The difference between the two symbolisms is that the former may or may not be related to a natural fact, whereas the other, we feel, is so related, and the relation is somehow implied by its constituents, but not by its structure. Yet it is structure, not the nature of constituents, with which logic deals.

Now the structure of the two expressions, the proposition and the correlative propositional concept, which for convenience I shall call respectively p and p_c, is the same in a very precise sense, namely: that for every element in p there is an analogous element in p_c, and for every relation between the elements of p there is an analogous relation between elements of p_c; in other words, the pattern of the two systems is the same. But in the genuine proposition there is a symbol which does not affect the pattern itself; it is an element related to something *outside* the system which is the proposition. This element is the verb. Within the complex, the verb is related to every element of p exactly as the correlative verbal noun is related to the respective elements of p_c; therefore its presence does not alter the pattern. But over and above its character as a part of the proposition, it has the office of *relating the entire proposition to something else*, namely, the fact which is asserted. In Wittgensteinian phrase, the true verb symbolizes the relation between the picture and the fact. It has, therefore, a double function; (*a*) it relates certain elements within the system, and (*b*) it relates the system as a whole to another system as a whole. The *grammatical form* of the verb is the accepted symbol for this latter relation.

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The fact that the symbol for this relation is traditionally incorporated in the verb, rather than in any other element of the proposition, has given rise to the belief that verbs are peculiarly related to truth and falsity. But the function expressed by the verb is not really a function of the verb; it is a function of the whole propositional construct. There are various less familiar ways of expressing it. We may, for example, take *a.R.b* to stand for a propositional concept, such as "Socrates' loving Plato"; if we would signify that *a.R.b* is to be related to some other complex, e.g., a complex of fact, we must add a symbol for this relation, such as the "assertion-sign," and write: $\vdash$ *a.R.b*. Here we have not altered the internal structure of the system. Now the sign $\vdash$ stands in no relation whatever to *a,* to *R,* or to *b*—nor even to *a.R.b*. It does not belong to the structure of the proposition.[10] It relates *a.R.b* to a complex whose existence is understood when we use the sign $\vdash$. And this is the meaning of the "purely logical sense of assertion" which Mr. Russell seeks to locate in the verb's "curious indefinable intricate relation to the other terms of the proposition which distinguishes a relating relation from the same relation abstractly considered."[11] This sort of assertion has, indeed, nothing to do with psychology, being a purely formal relation. As long as we limit our logic to the study of propositional structures, this relation will, of course, never appear; it is through the logic of forms as such—meaningless forms, or patterns—that the function of the assertion sign, which is the same as the extra-structural function of the verb, is exhibited.

We now come to the second mysterious agency of the verb, its alleged power to weld the proposition into a unity. Mr. Russell holds that "the verb, when used as a verb, embodies the unity of the proposition, and is thus distinguishable from the verb considered as a term, though I do not know how to give a clear account of the precise nature of the distinction."[12] But from our present point of view, the verb appears to do nothing of the sort. It is not a logical glue. Only because it relates *the structure as a whole* to another structure, it *presupposes* the unity of the structure. The case is analogous to a mathematical expression such as $(a + b)^2$. Here the exponent expresses a function of the unity $(a + b)$, but it does not create this unity—it presupposes the indivorcibility of the complex. The parentheses serve to signify the unity. If, then,

[10] That the assertion sign is not one of the symbols of the proposition was noted by Frege (*Grundegesetze der Arithmetik,* p. 43): Den Urtheilsstrich rechne ich weder zu den *Namen* noch zu den *Marken;* er ist ein "Zeichen eigener Art."

[11] *Princ. of Math.,* p. 84.

[12] *Princ. of Math.,* p. 50.

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in a propositional concept such as "Socrates' loving Plato" we change "loving" to "loves," we express a function of Socrates-loving-Plato, and this function naturally presupposes the entire structure as a unit. But it does in itself act as the parentheses.

Thus it appears that the inter-structural relation expressed by the verb in a genuine proposition is the basis of (*a*) the verb's peculiar power of trafficking with truth and falsity, and (*b*) its alleged glutinous character. The former of these two points merits a little further consideration. Truth and falsity are, after all, metaphysical gods, not to be worshipped openly in the realm of logic. The question is, whether we can dispense with them here, or not.

Given any genuine proposition which is true, we have therein a system related to another system. The referent in this relation is the verbal or conceptual system which is the proposition, and the relatum is the system of *fact*. This saddles us immediately with a correspondence theory of truth, which I think Mr. Russell willingly accepts. But thereby he assumes all the burden of falsity, which leads him to psychological pitfalls of belief—the burden of negative facts—of mental facts which defy the familiar causal laws—of "poetic" truth and falsity—and finally of complexes which look sensible enough, but are meaningless concatenations of ink-spots or noises, such as "the present king of France is bald." All these metaphysical hoodoos seem to me to owe their existence in his logic to the fact that he conceives propositions as essentially true or false. The meanings of true and false propositions are *logically* nothing but objective systems of definite structure; that the structure referred to by true propositions happens to be the order of existence, is interesting for metaphysics, but irrelevant in logic. Propositions do usually refer to matters of fact, but not necessarily so—and even if this reference were universal, all that need concern us as logicians is that they refer to some structure other than themselves. This may be the structure of reality, as in assertions of fact, or of an imagined world as in the case of "poetic truth," or of carefully constructed beliefs as in hypothesis.

It will undoubtedly be noted here that the term "objective structure" has become ambiguous. In one sense, every word or phrase recognizable as a symbol refers to such a structure; for example, a false propositional concept such as "Hamlet loving Polonius" has a definite objective correlate among *thinkable situations*, and this correlate, like the symbol, is a structure. But when I say "Hamlet loved Ophelia," the symbol refers to a structure beyond the mere conceptual counterpart of the words; it refers to a structure which exists *in a definite consistent order*, and this order is Shakespeare's

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Hamlet. This further reference to a whole order of constructs is what is implied by validity of a concept, or *logical assertion* of a proposition. We can certainly assert in a logical as well as a psychological sense that Hamlet loved Ophelia.

Herein lies the distinction between meaning and validity; a structure has meaning in so far as it refers to *any* analogous objective structure, and it has validity when its correlate has a definite place in a coherent order. The former relation is given by every symbolism and is that by virtue of which we have a *symbolism* at all; the latter is given by assertion, and might be termed the "propositional use of symbolism." Meaning in itself belongs to unasserted and invalid propositions, to propositional concepts, to names, and, in short, to signs of every sort and condition.

In symbolic expression we require the assertion-sign or some equivalent because we have no tacitly accepted difference in our symbolism to distinguish the proposition from the propositional concept. In common speech, however, we have worked out a general semantic for this purpose. It is not very precise, but it is usually well understood. The verb-form is its most obvious part. But since the verb has the dual function of relating terms of the proposition, and also relating the proposition to its object,—that is, since it combines the offices of the verbal noun and of the assertion-sign—we sometimes want to retain it for the former purpose without the latter. Our symbol for this exception is the inverted commas which mark an unasserted proposition in common discourse. The inverted commas have a function similar to that of the symbol "♮" of musical notation. They cancel a previously accepted function of the term they modify.

Psychologically, the inverted commas change our attitude toward the enclosed proposition; logically, *they change the proposition to a propositional concept*. The unasserted proposition functions exactly as a propositional concept. If we say " 'Cæsar died' is true," we are cancelling the truth-value of "Cæsar died," and assert the same proposition as "It is true *that Cæsar died*," where "Cæsar died" becomes a subordinate construct in grammatical form as well as in meaning. Many logical puzzles, such as the difficult notion of the "proposition as a fact" in distinction from the genuine proposition, disappear when we realize that a "cancelled" proposition, a dependent clause, and a propositional concept are logically exactly on a par. The unasserted proposition, like the propositional concept, bears the same relation to the assertion wherein it figures, as, for example, $(a + b)$ bears to the whole expression $(a + b) - (c + d)$: and the verb in the unasserted proposition has a subordinate force

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like the +'s in the above expression. Exactly the same relations are expressed in common language where the subordinate propositions are set apart by inverted commas or modifications of the verb, and the relation of the whole to some system in fact or fancy is implied by the "genuine" verb.

The extra-systematic function of verbs seems thus to account for many of the supposed "alogical" features of logic. The fact is, of course, that "logical" and "alogical" must always refer to a particular system of logic wherein we move. The alogical factors of meaning, truth, assertion, etc., which early beset Mr. Russell and recently drove Mr. Wittgenstein to Mysticism, appear to me to have sprung from the error of treating logic as essentially a study of *propositional* forms. But the logic which concerns itself with all sorts of forms allows for an analysis of structures *including* propositional forms, and promises to save some important logical relations from their present metaphysical limbo.

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BOOK REVIEWS

Mind and Its Place in Nature. DURANT DRAKE. New York: Macmillan Co. 1925. Pp. xvii + 259.

Professor Drake's new book is clearly and forcibly written, seems reasonably self-consistent, and will be accepted, I believe, as a creditable and workmanlike piece of philosophical writing. If as a result of this earnest effort to commend a particular philosophical creed to his fellow-philosophers he should fail to make many converts, the fault will lie much more with the doctrine expounded than with the exposition.

One of the first impressions readers who are at all familiar with Professor Drake's writings are likely to get from an examination of *Mind and Its Place in Nature* is that its author has himself at last experienced conversion from the more or less disguised dualism of his former theory of knowledge to a thoroughly monistic form of realism. In his doctor's dissertation, *The Problem of Things in Themselves,* published in 1911, the dualism is unmistakable. There it is roundly declared that the data of perception are "a different existence from the things." In the well-known cooperative work, *Essays in Critical Realism,* published in 1920, while it was indicated that some doubt existed in the group as to whether or not the position taken should be called a dualism, the view was expressed by Mr. Drake that by means of the analysis accomplished by the col-

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