A verifiable solution of the "RIDDLE OF THE UNIVERSE"

U N I V E R S E

By SCUDDER KLYCE

With three INTRODUCTIONS by

DAVID STARR JORDAN,
Chancellor Emeritus, Stanford University

JOHN DEWEY,
Professor of Philosophy, Columbia University

MORRIS LLEWELLYN COOKE,
Consulting Engineer, Philadelphia

This book solves all problems of why, how, what, in science, religion, and philosophy. Or, it gives an intelligible and unified statement of the fundamentals of all things, and applies that to everyday life. It is addressed to the average educated man, but is designed to meet the requirements of experts in various branches. The book is experimentally verifiable.

Some of the particular things the book does are:-

Establishes a sound logic. The logic used by the ordinary man is right; that used by Aristotle and nearly all books is wrong.

Removes the fundamental error from mathematics, and makes mathematics simple; proves Euclid's "axiom" about parallels, and intelligibly solves the various problems of non-Euclidian and n-dimension space.

Revises and unifies the equations of physics. Completes conventional "theories" of physics—about a dozen,—and makes a somewhat new one that is easier:- vortex whirls.

Shows how gravity works. Shows what is wrong with Newton's law of gravity, and why. Makes Einstein's theory actually intelligible—showing that it is one sort of possible language out of an infinite number of possible valid languages or logics. The book shows that everyday language (Euclid's and Newton's and Christ's) is valid, and the most economical and practical — and uses it.

Shows intelligibly what electricity, light, matter, energy, etc., are. Gives birth, life, death of solar system.

Shows how to get energy out of atoms, etc.

That simple and easy physics is used in the last third of the book to solve qualitatively the more complicated human problems—those of age, growth, death, life, birth, sex, medicine, immortality, good and evil, freedom of will, religious experiences and ethics in general, money, taxes, business principles, value, etc.

Proves that the Constitution is right, and shows what democracy is, and proves that it is right and that all other forms of government and 'legal' law are wrong.

Proves (verifiably, of course) the doctrines of Christ; disproves the essential ones of Paul and theologians.

Extracts from the INTRODUCTIONS:-

Dr. JORDAN, one of the leading scientists of the world, says:- ". . .unique . . . daring . . . successful . . . Mr. Klyce makes no attempt to solve any scientific problem by pure reason, but he would have us make rational use of the knowledge we possess."

Professor DEWEY, by many regarded as the leading living philosopher and logician, says:- ". . .The sincerity and power of the book, and the radical simplicity of its unifying idea give it every claim to a hearing. . . . I hope what has been said may indicate the extraordinary value of Mr. Klyce's work for philosophers, and, in connection with the way in which he applies the formal unification outlined to the mathematical, natural and social sciences, to all persons interested in reducing intellectual obfuscation and confusion. . . . . . .Mr. Klyce's book is remarkable, noteworthy. If experts in various lines shall find his special results as fruitful, as illuminating, as his general treatment of knowledge and technical philosophy has been to me, the remark just made will turn out to be altogether too moderate. Any remark of mine about the value of the book in anticipation of this result will seem intemperately extravagant."

Mr. COOKE, a leading engineer, says:- "The world today needs broad generalizations, but even more it needs counsel as to their application to specific situations. This book fulfils both these requirements in a very special way. For this reason I am recommending it, not as a philosophical treatise, but as a text book with an everyday usefulness for all those who are trying to bring some measure of reasonableness and order and effectiveness into our turbulent industrial life. . . The book as a whole, in spite of its austere mechanics, is not hard reading. This does not mean that there are not places—in fact whole sections—which I made no effort to get and others which I read superficially. But the author has developed quite a knack of using words in not only a precise but a commonly accepted way, so that over a greater part of the journey, a lack of mathematical and scientific training is not an insuperable handicap. . . Of course, if one readily understood and as readily agreed with everything in a book like this, it would be too simple a document to merit much attention. . . . I will be much surprised if to most men a reading of 'Universe' will not make the struggle [of life] a far simpler matter than it usually seems to be."

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ERRATA

The errors in this following first list are those which the reader can not readily see at once are errors, and see what is correct. The second error in the list was made only in about half the copies.

§ 42d line 8 Read stayed instead of stated.
74f line 32 Equation should be $Density=MI^{-3}$.
76e line 14 do $c=Q_{me}T$.
89b line 21 Read Reeve's instead of Reeves's.
96c line 2 Read chapter instead of section.
98n line 34 Read or instead of of.
114d line 3 Read or instead of and.
132a line 9 Read lower instead of slower.
132e line 10 Read 1913 instead of 1903.
136c line 14 Read *F* instead of the second *E*.
Footnote 168h-iii line 37 Read good instead of 2nd poor.
do -v line 14 Read of instead of in.

This second list is a list of paragraphs in which typographical errors occur that the reader can readily correct for himself if he notices them. In a number of the listed cases I caught the error myself and corrected it before printing all the 1000. —— I know that there are some more-technical errors I haven't listed; and probably there are numbers of errors I haven't found.

§§43cf, 44d, 47h, 49d, 50e, 59ae, 60i, 61a, 63c, running head p. 61, 72d, 74b, 76e, 78a, 80c, 81h, 83e, 84b, 85b, 86cdh, 90c, footnote 98d, 98g, 99ab, 100g, 101b, 104b, 112a, 113c, 116b, 118e, 120ik, 122j, 126bg, 133e, 136c, 144hi, 145c (two), 146k, 147fg, 148b, 149jq, 151a, 153d (two), 155b, 161b, 162fj, footnote 166d, 166nr, 167j, 168dmnp, 170k, footnote 172c, running head p. 233, 175c, 176b, footnote 176d, 176e.

THREE INTRODUCTIONS

FIRST INTRODUCTION

by

JOHN DEWEY

Mr. Klyce has invited me to write some prefatory words for his book. In spite of my technical incompetency in physical sciences and realizing the handicap that imposes upon me, I have gladly consented. For although the argument of the book as a whole must finally stand or fall with the treatment of topics where my lack of knowledge makes it impossible for me to have a real judgment, the sincerity and power of the book, and the radical simplicity of its unifying idea give it every claim to a hearing. And judging from the parts where it is possible for me to follow intelligently, I have a strong presentiment the other parts do not go far wrong in substance:—Mr. Klyce himself makes plenty of allowance for deviations in special points.

Mr. Klyce says somewhere in effect that every reader of this book will have in the end to rewrite it for himself. My introductory remarks can not take any other form than rewriting that portion of Part One which sets forth the fundamental logic—or method—of the book.

He says that the book "unifies or qualitatively solves science, philosophy, and religion." Many cultivated readers will be likely to stop right here. While they tolerate or laud classic philosophers for attempting such unification, they associate, with painfully good reason, contemporary professions of such solutions with pretentious ignorance. To make such a claim is the common sign of the incompetent amateur in philosophy and science. My first rewriting is of this phrase.

Mr. Klyce emphasizes *qualitative* unification. He expressly points out that concrete problems of science and practical life are solved only in living them intelligently. For the word *qualitative*, we may write the word *formal*, and contrast it with material unifications. Then we note that such attempts as are in unenviable repute owe their offensive arrogance to claiming material unification. Every philosopher deals with the problem of formal unification, either positively or negatively.

What is significant in this book is not, then, the claim of unification but the *way* it is worked out. Every reader knows how common are phrases that combine antithetical terms, terms that taken separately oppose each other. Examples of such pairs are:- rest and motion, space and time, matter and energy, potential and actual, analysis and synthesis, one and many, individual and society, common and proper noun, cause and effect, freedom and authority, quantity and quality, prose and poetry, parts and whole, mind and body, flesh and spirit, God and nature, purpose and mechanism, static and dynamic; or upon a slightly more technical plane, discrete and continuous, substance and properties, elements and relations, existence and essence. Now the natural mind, the commonsense mind in the best usage of that ambiguous phrase, is not perplexed by those combinations of opposites. They seem natural, complementary; expression is incomplete without both.

Philosophic reflection begins with an express noting of the opposition between the terms of such pairs. It sets out to reconcile them, to get a qualitative or formal unification. Or it denies the possibility of any unification, and holds that all knowledge since it goes on in such terms as motion *and* rest, space *and* time, is "relative." Or, the apparatus of knowing gets between us and the things to be known. Or it generalizes the pairing off into a rigid dualism of the separate, independent forces, substances, principles. Or, like Hegel, it takes the bull by the horns and declares that all "reality," all "truth" is a union of contradictories.

Now it is a conceivable hypothesis that commonsense is innocent of these contradictions because it always uses the terms with reference in a context, to mark or point out features in a situation, and with no other intent than calling attention to them, either as memoranda for one's self or as guides for another. This supposition does not as yet explain the opposed character of the terms, or why they go in pairs. But it raises another interesting hypothesis. What would be the effect if some one else reflecting on the agencies of pointing and marking forgot their directive use, and took them to *convey* something otherwise than as pointers to observations? May not this explain why the terms are effective in ordinary usage and stumbling blocks to the philosopher?

This last paragraph is one way of rewriting another sentence of his Introductory Remarks which will give offense to some readers:- that the author's method of complete formal solution has to do with a "mere trick of words." Unfortunately, not all readers, or writers, take words as seriously as Mr. Klyce does. He himself points out that a *mere* word is but a passing sound or a patch of ink. What he is doing, as he clearly points out in §2de, is to investigate the fact that knowledge is a statement or expression, and to investigate this fact by the same experimental methods that have hitherto been confined to the things stated or expressed. Now language as a machine of expression or statement is something quite different from a mere trick of words; and in §155 Mr. Klyce vividly depicts the psychology that makes him from time to time resort to such depreciatory phrases. The reader must balance it with the term "absolute unification of science, philosophy, and religion," as he is used to balancing the terms rest and motion, whole and parts.

Let us return then to the hypothesis that in actual use names call attention to features of a situation; that they are tools for directing perception or experimental observations. The first thing to be noted is that the "situation" is referred to only in the (literally) *most general way*, as the limiting including thing within which specific things are pointed out. A gesture calls attention to a dog-fight. It doesn't call attention to the town, to the world or the sun and its light or to the previous history of the animals or to the position and expectations of the observer. And if some special feature within the dog-fight is then pointed out, a broken leg, the fight itself is no longer specified. It takes care of itself. It is now the "situation" as the entire visible scene was formerly the situation within which the fight was discriminated. The *situation* as such in short is taken for granted. *It* is not stated or expressed. It is implicit, not explicit. Yet it supplies meaning to all that is stated, pointed out, named. Its presence makes the difference between sanity and insanity. We may say if we will that it is ignored. But the ignoring is not the ignorance of denial. Ignoring means "understood," assumed as a matter of course as the background and foreground which gives intelligibility and state-ability to what is explicit, expressly pointed out. Now the implicit situation cannot (save arbitrarily; that is, by some agreement for a purpose) be stopped short of Everything. The setting,

the implicit situation, shades off from the explicit, indefinitely and continuously. "Everything" is understood, implied, then as the setting, or meaning-giving force, of what we explicitly say or state.

Recur now to the actual naming or pointing. It discriminates, distinguishes something; makes it explicit, states or expresses it. That which is pointed to gives the meaning of the word or directive gesture. But the *lone* thing pointed at has no meaning. We always distinguish one thing *from* something. All explicit names point out then a comparison-contrast of at least two things. A *This* by itself, as Mr. Klyce points out, has no meaning. It is not an expression or statement, but merely another thing, a noise or figure. *This* explicitly implies *That*; *Here* explicitly implies *There*; *Now*, *Then*. In short, the simplest possible intelligible statement *explicitly* implies a number-of-things-related-together, while it *implicitly* implies a sum total, or an 'Everything' with which the related plurality of things is continuous. This is a "trick" of language just as a watch may be called a trick of steel. It is the only way a thing can be done, in one case keeping time, in another case giving direction to observations of existence. Size and complexity in both cases may vary indefinitely; and substitutes may be found for steel, and different signs in language. But the way, the principle, remains the same. Here is the qualitative or formal unification.

This is one way in which one basic proposition of Mr. Klyce may be rewritten. This way of writing will probably appeal especially to those habituated to philosophical modes of writing. For it suggests that the problem of statement, or language, is identical with what in philosophical writing is called the epistemological problem, the problem of knowledge. Science is the *expression* of experiments with things. It isn't the things over again, nor is it simply the experiments. It is communication of them with their results in consistent form. The simplest and most objective way then to examine knowledge experimentally is to examine consistent expression or statement experimentally—to see what happens when we do or make it. The method as used by Mr. Klyce gets rid of an enormous amount of cumbrous and largely effete psychology. It cuts out an enormous mass of historical reminiscence that obstructs the path of one who approaches the subject in the traditional way. To philosophical readers (to those who use that particular dialect) I would point out the freshness and directness of Mr. Klyce's method of approach to the old problem of the nature of knowledge.

This remark applies to his method irrespective of the results he has obtained by its use. Let us now return to an inspection of these results. In any intelligible statement, from a gesture to a complete discourse on science, there are *two* kinds of implications, one implicit, the other explicit. The explicit implication is that of relations between elements; that is, between distinguished parts. The implicit, understood or taken for granted is, ultimately, as we have seen nothing less than the universe or "Everything."

Now (1) this implicit implication is strictly ineffable. It cannot be stated. For it is required to give meaning to any statement. Yet it is convenient, and for consistent expression of complex matters it is necessary, to have a term to refer to it. It is necessary to have a word which reminds us that whatever we explicitly state has this implicit, unstateable, ineffable implication. Hence the terms which Mr. Klyce calls *One* words, like all, nothing, only, being, every, infinity, universe, whole, never, always. These words have no (definite) meaning. In philosophical terminology they are transcendental, noumenal, a priori. They are religious terms, like God, eternity, perfect rest or peace, complete salvation. An experimental realization of their meaning is had only emotionally, and the emotion may be poetic, esthetic or in some cases mystic. Speaking in philosophical terminology, we have here revealed the truth and the falsity of the whole brood of absolutistic, transcendental philosophers. They have had a genuine experience of *All*, which is required for the meaning of any consistent statement. But they assert that these *One* terms themselves have a meaning; that they are terms *of* statement. Or if they are professional mystics, the ineffable character is recognized, but the experience is regarded as a special, separated, not to say unique, experience, instead of what is implicit, in some degree of intensity, in every experience.

(2) The other side of statement is distinctions-in-relations, *Many* words, and Relationship words. Here the ways of going wrong by failing to observe what we do when we state or express or 'know' are more numerous. The most general and fundamental one is to turn the ignoring of the Everything or Universe (to take Mr. Klyce's favorite term, tho to some it is too indicative of the starry heavens) which is equivalent to its implicit assertion into its explicit denial. This is the root of all kinds of phenomenalism, relativism, agnosticism. For it amounts to asserting that the very act of making known (expressing) mutilates reality, puts a veil or screen between us and reality, hides things-in-themselves from us, perverts it in bringing it within our grasp. This is the root of all agnosticism and subjectivism—the notion that the process of knowing intervenes between us and the things to be known. And Mr. Klyce's examination of Statement shows that this notion is due to failure to grasp *all* that is done when we state; namely, refer to the Whole as the context within which what is explicitly stated falls as constituting its meaning.

Every statement (or knowledge) fully realized in its import or logical form links us up with the Whole, instead of cutting us off from it. And this is true when the statement is materially wrong—as every statement in its explicitness is bound to be in *some* degree. For *some* of its implicit junctions with the Whole may be rendered perceptible in further statements. If the statement is sincerely taken, they not only may but *will* be. Every intelligible statement contains within itself, in other words, the conditions of its own rectification, provided we carry out the experiments it indicates. I think that those who appreciate the force of these remarks and who find them verified in their own experience will agree that Mr. Klyce understates rather than exaggerates the emotional relief and expansion that may come with it.

Other fallacies which arise from failure to perceive fully what happens when we state or make known (to ourselves or others) are materialism and mechanism—as a wholesale 'ism, that is. This arises from observing that parts are discriminated and failing to observe that they are at the same time related. The problem of relations and elements is a familiar one in philosophical writings. Perhaps one need here only call attention to the likeness and unlikeness of Mr. Klyce's treatment with that of Mr. Bradley. The latter also points out that every statement both analyzes and synthesizes, selects or partializes and also unifies. But he places those functions over against each other. Selection mutilates the living fullness of reality. Unification adds as it were insult to injury; it falsifies, for the selected parts are not as such capable of union. They unite only in the whole. From this property of statement (judgment, in Mr. Bradley's language) he infers that everything we judge is compelled to take on the form of appearance, because it involves self-contradiction, and this cannot be found in reality.

All this is suggestive of Mr. Klyce's insistence upon identity or "circular perception" as the test of statement, and

his pointing out of contradiction between the many and the one in every statement. But where Mr. Bradley ends, Mr. Klyce begins. He points out that this contradiction is itself contradicted by the assertion (indication) of the implicit Everything. The elements selected are *so* related in every intelligible statement as to constitute the Whole; or, the situation is *so* distinguished that it has an infinite number of elements. And infinity is again a reference to the Whole. This is the "verbal trick" in its simplest form. The infinite regress of relation and element which Mr. Bradley points out in judgment is to Mr. Bradley another sign that our knowledge does not get beyond Appearance. Mr. Klyce shows that this infinite regress is the method by which every statement indicates or refers to the Whole. It negates the seeming arbitrary selection of some parts by calling attention to the fact that the Whole has an infinite number of other parts: that is, is a whole.[1]

Another fallacy arises from confusing relationship terms with many or one terms. In this case, we get pseudo-idealism, pseudo-intellectualism, abstractionism in the sense which Mr. James so vividly condemned. Mr. Klyce refers as an instance to the fact that many writers dress up the relationship word *truth* in shining armor, and exploit emotions with it. All idealism of the self-conscious, professional type is of this nature; all idealism, that is to say, that opposes the ideal to the actual, and throws contempt upon the actual and concrete; which sets up ideals as something above and too good for the common man in common experience. It is the aristocratic vice par excellence. The ideal is the Whole implicit (tho not implied in the ordinary logical sense of implication) as the meaning of *every* intelligible experience. Hegel doubtless saw this in a way, but made the typical idealistic error of supposing that the task of philosophy was to derive modes of statement superior in kind to those of commonsense and science in which the implicit whole should be rationally explicated. In fact, the philosopher has the humbler task of pointing to the fact that every consistent statement already refers to an ineffable whole. Realism, especially modern analytic realism, on the other hand, ignores entirely the implicit, and insists only upon logical implications; that is, relationships which can be made explicit. As a consequence its relations become only another and strange kind of things or parts. An atomism results which taken strictly forbids all statement whatever—as the Greek critics of a similar view long ago pointed out.

A word may be added on Mr. Klyce's elimination of the bugaboo of subjectivism. Mr. Klyce gets rid of it by starting with expression or statement as itself an objective fact which can be observed like any other event. His method may be said to assume or imply that expression is a 'function' of things just as heat is. But this assumption is, as Mr. Klyce points out, merely formal in both cases. The *meaning* of the "assumption" that heat or a statement is there (is happening) is not found *in* the statement about heat or expression but in the observation of the happening itself. A finger-board on the road does not materially assume anything about the town to which it points. It actually or materially does nothing but point. The only "assumption" is that *if* you take the road you will find——what you will find; that which you find is alone the real meaning of the sign-board. The sign may lie; Mr. Klyce may be mistaken. But the only way to find out either thing is to take the path indicated. In the case of the book this means to observe, with the guidance of its author, the thing or happening called expression. It takes a considerable amount of skill and a large degree of vision and good will to follow the road, but that is all.

[1]In rewriting one part of Mr. Klyce from the standpoint of the traditional problems of the theory of knowledge, I am doing him an injustice not only from the standpoint of the larger public not concerned with technical philosophy but from the standpoint of professional philosophers. For reference to the positive development of implications of space, time, energy, units of science, and the formulae for their relations, in which Mr. Klyce makes his formal unification fruitful is omitted.

I hope what has been said may indicate the extraordinary value of Mr. Klyce's work for philosophers, and, in connection with the way in which he applies the formal unification outlined to the mathematical, natural and social sciences, to all persons interested in reducing intellectual obfuscation and confusion. Many thinkers have had the laudable ambition of exhibiting the connection of science and philosophy with commonsense. But usually they have taken commonsense to mean a mixture of the operation of sound sense with a body of inherited engrained traditions and sophistications. Mr. Klyce has taken commonsense in its radical and simplest form, the form of stating or making anything known. He has himself pointed out the reason why his thought is not always easy to follow. The most difficult thing in the world to learn to see is the obvious, the familiar, the universally taken for granted. Taken as a sketch of a certain way of discovering the meaning of knowledge in general and in its typical branches, Mr. Klyce's book is remarkable, noteworthy. If experts in various lines shall find his special results as fruitful, as illuminating, as his general treatment of knowledge and technical philosophy has been to me, the remark just made will turn out to be altogether too moderate. Any remark of mine about the value of the book in anticipation of this result will seem intemperately extravagent. After the result, it will, fortunately, be quite unnecessary.

JOHN DEWEY.

SECOND INTRODUCTION

by

DAVID STARR JORDAN

The unique treatise for which I have been asked to write a few words in introduction impresses me as a daring and successful effort to aid straight thinking by the accurate use of language. Its central purpose is to bring into the realm of Science the philosophical conception that all that exists is in a sense of one piece,—infinite variety embraced within infinite unity. Thus the Universe may be looked on as a majestic Federation of Energies, an infinite machine in which all parts fit and cooperate.

Oneness, however, does not imply tangible sameness, though some apostles of Monism have insisted that underlying unity inevitably postulates at least some measure of objective identity—as of matter and force, for example,—or more concretely, of all the chemical elements, one with another. But to be fundamentally "at one" does not necessitate any such sameness. Matter and force must complement each other, in some positive sense, as the key fits the lock. Indeed there are numberless intimate relations which do not necessarily involve identity of origin, form and substance. In a harmonious universe (however we may describe it) there might be (and we can know only by observing) a million definitely distinct chemical elements, not interchangeable and not derived from Haeckel's fancied "Protyl," or any other primitive world stuff, whether matter or spirit. As to this and to all other questions of fact, we shall never know the answer until we find it out by looking. Moreover, the conception of the unity of the Universe need not ever

reduce it to a single substance, nor even to a single definite purpose. Pluralism (multiplicity in unity) is as true as oneness, in the meaning given by William James's assertion:- "No one can question that the Universe is in some sense one, but the whole point lies in what that one is."

Science is human experience tested and set in order; any belief which neither demands nor permits verification lies outside of Science. All propositions which can be proved by deduction or even proved completely (see §35 of the book), belong to the realm of expression or Logic, not to Science,—conclusions being involved in premises. Pure mathematics, for instance, is the logic of number and space, and its demonstrations, however intricate, are derived from its definitions. Similarly, a definition of the Universe can be framed in such a way as to make its unity self-evident;—in fact no other definition that is self-consistent is possible: but no scientific conclusion can be deduced from proof thus obtained. Details of reality—matter, force and life—would be no nearer demonstration than before, for these we know only from the coordinated results of human dealings with them.

Knowledge, never complete, may be relatively exact or inexact according to the sufficiency of our data. In no field has Science yet reached completion,—and it is in the nature of things impossible that it ever can. It sees some things very definitely; but the unknown lies as a trackless wilderness on every hand. As details accumulate, generalizations are possible—and even prophecy with some degree of certainty. In Physics, Chemistry, Astronomy, relative exactness prevails. The simpler the factors involved, the more definite our mastery. Obstacles in the relatively exact sciences are mainly our human limitations. The enormously distant and the extremely small elude precise observations; star and electron baffle alike; the bulk of the Universe is beyond our definite seeing. "Time is as long as space is wide," and no one can conceive a limit to either.

The sciences concerned with life deal also with the elements of matter and force, but in highly varying relations. In any biological problem, conditions due to the relative position and relation of atoms and molecules, of cells and tissues, of organisms and environment, are visibly varied almost to infinity; data of one sort or another everywhere abound, but the more we have, the more we see we need. Untested problems crowd on every solution. In biology, therefore, to a degree greater than in the more exact sciences we cannot know what we know or what we do not know with completeness or ultimate precision.

The only final test of a supposed fact is found in our ability to prove it by trusting our lives to it, or to the method by which it is gained. Simply to demonstrate that a proposition will "work"—that is, "muddle along" after a fashion —is not enough; in all its parts it must stand a supreme test, that of "liveableness." Such a direct and conclusive proof, however, is not available in all life's complex and immediately pressing situations. The next resource is to test the method behind the conclusion. The aggregate of knowledge, so tested, constitutes Science, which then becomes the guide to conduct, though never infallible, because never complete. In default of personal experimental knowledge as to matters of fact or ideals of conduct we make the best we can of the conclusions of others, trusting to the strength of the method by which the conclusions are reached. We thus have an acceptable hypothesis on which to act until the returns from personal experience begin to come in.

Mr. Klyce makes no attempt to solve any scientific problem by pure reason, but he would have us make rational use of the knowledge we possess. As to the fundamental coordination of all which exists, known or unknown,—any consistent use of the word Universe implicitly asserts it. Man himself is able with fair success to make his way in the Cosmos; obviously then he is not utterly alien. Not only does his continued existence prove him not alien, but furthermore, by taking thought, he can make headway against the forces of nature and thus in some degree shape his own career. A similar line of argument is shown to apply to every concrete thing of which we are cognizant. The burden of disproof of Mr. Klyce's thesis lies on him who, within the confines of the Universe, can conceive anything—matter, spirit, life, space, or time—which lies outside it.

DAVID STARR JORDAN.

Stanford University, California,
March 20, 1920.

THIRD INTRODUCTION

by

MORRIS LLEWELLYN COOKE

The world today needs broad generalizations, but even more it needs counsel as to their application to specific situations. This book fulfils both these requirements in a very special way. For this reason I am recommending it, not as a philosophical treatise, but as a text book with an everyday usefulness for all those who are trying to bring some measure of reasonableness and order and effectiveness into our turbulent industrial life.

Industry is not only still in the making, but it is in its infancy rather than its adolescence. Just as we begin to realize that civilization is dependent on industry for its very existence we have come to see that this same industry is really not related to Life in any vital way. It is a perilous position and no one claims that the path ahead is at all clearly defined. The perpetuity of our institutions seems to depend on whether in a generation or two we can come to have a better understanding of this Juggernaut we have created. For it is daily more apparent that all will not be well in the world until each unit of the structure of industry is sympathetically related to every other and to industry as a whole, and that industry itself must understand in some measure its relation to Ultimate Reality.

Our industry has been very largely a matter of trading. But the barter basis is disappearing with the advance of science. More and more it is the trained engineer or the man with engineering training who holds the key positions in industry and commerce. But Engineering in the past concerned itself very largely with things. Up to a generation ago engineers were for the most part either designers or constructors of things, i. e., bridges, dams, railroads, power plants, etc. Then the operation of these agencies began to be included within the scope of Engineering. Only quite recently has it come to be considered that in the operation of most industrial enterprises the engineering method is apt to be the most effective. Thus has been developed the engineering of men, sometimes called 'human engineering' in contrast with what has been the more technical engineering of materials. This book, from the business man's or engineer's point of view, undertakes to establish a proved and verifiable scientific basis for this new branch of engineering which some people prefer to call 'efficiency engineering.'

The book as a whole, in spite of its austere mechanics, is not hard reading. This does not mean that there are not places—in fact whole sections—which I made no effort to get and others which I read superficially. But the author has developed quite a knack of using words in not only a precise but a commonly accepted way, so that over a greater

part of the journey, a lack of mathematical and scientific training is not an insuperable handicap. The author advises readers—especially at certain places—not to work too hard to get out all the meaning. I dare say that the average reader who will approach the book in this spirit will get about all the author expects anyone to get on first reading and will then be tempted to start all over again.

The reader should be on guard against being unduly stirred by the author's mannerisms. In some of his comments on "theologians and lawyers" for instance it seems to me that he lapses from his general technique of tolerant expression and philosophy. Of course, if one readily understood and as readily agreed with everything in a book like this, it would be too simple a document to merit much attention.

It is altogether impossible to epitomize the conclusions of any such book. But among many pithy phrases which Mr. Klyce has coined, "balanced co-operation" stands out as one having special significance in the industrial field. It means something more than doing unto the other fellow what you would have him do to you. It seems to involve a measure of action and reaction as between units and groups, which will in every instance be conducive to well-being and growth all around. During the War it would frequently have suggested to organized labor the advantage of restraint in pushing wage claims, and at the present moment it should give pause to those employers who tend to push their opposition to labor unions beyond the checking of their obviously untoward tendencies. According to the author, democracy allows or requires that each side to any discussion re-act to the other. This is the exact opposite of the "We have nothing to discuss" or the "Public be damned" attitude.

After all, whether you are king or labor leader, business man or priest, your master decision is as to whether you will be—to use the language of the book—a "dualist and an autocrat" or whether, constantly studying the unity of all modes and expression of life, you will seek through "balanced co-operation" to participate in the execution of purposes and a Purpose not your own.

Mr. Klyce has shown a "capacity for infinite pains" in carrying his main thesis into so many different scientific realms and there seeking to establish its truth. Too frequently we have been asked to take judgments on scientific, religious and philosophical matters from men who having grown up in one group inherit points of view—even prejudices—which would be dissipated by a larger outlook on life.

Vernon Kellogg says that while "The biologist does have a certain positive knowledge of some conditions or factors that do help to determine the course of human life," it is also true that "the course of human life is partly determined by a set of conditions which are, so far, at least, quite outside the special knowledge of the biologist. He can guess and wonder about them, just as other people do, but he has no right to claim that he knows about them." The same remark obviously can profitably be made about any specialist.

Also, to any specialist is apt to come the moment—and and it is one of possible, even soul-racking, disillusionment—when the inadequacy of a narrow slant on life becomes apparent. The more sincere the worker and the more fundamental his work the deeper the yearning to relate the individual effort to the totality of things. The surest way to give dignity to a simple act is to relate it to a purposeful life. The surest way to endow our industrial system with vitality is to scheme it out in harmony with all Life—to make the paying of a wage and the doing of the day's task in some genuine fashion God's service—to link them up with the Ultimate Purpose.

Of course a great industry will only result from the activities of great men. Most industrial leaders impress us as being literally worn out fighting against a flood of isolated facts and ideas. We need the unifying thought of this book. To be effective we need above all to make our lives simple. Men vary in their mental capacity, but it is undoubtedly true that some men with great capacities are not the match for men of ordinary abilities who "see life steadily and see it whole." I will be much surprised if to most men a reading of "Universe" will not make the struggle a far simpler matter than it usually seems to be.

The very familiarity which grows out of usage has afforded in the past in all too generous measure, the authority which we humans require to make us happy in our work and play. But in so many ways—through education, through a heightened individualism, and more immediately through the shake-up of the Great War—the mass of men are questioning all our procedures in a way heretofore unheard of. In the depths of the mines, in the vast silences where the lumberjacks toil, on the seas and in our great manufacturing plants near the centers of population, men are counseling together as never before, on the meaning of life and the meaning of industry and the relation of one to the other.

The idea that anyone knows in the old particularistic sense is gone. Have we not read only yesterday of Einstein and that theory of relativity that "upsets" one of the surest rocks on which our whole structure of knowledge has been built? We know now as never before perhaps that, to use the language of this book, "There is no exact science." And yet our respect for science deepens and our sense of dependence upon it has become altogether profound. This understanding of the place of science in industry and life is no longer confined to the schools. The nations begin to appreciate the hopelessness of preserving their identity except through science. The owners of our industries perhaps feebly—but altogether definitely—are studying in myriad ways the application of science to the production of goods. And now we detect the first beginnings of the same tendency in the organization through which labor expresses its purposes. Herein lies one of the great hopes of the race. When our workers reach the point where they can well abandon force and embrace science, humanity will be in for a new experience.

But a science that is unrelated is even more fearsome than an industry that is detached from life. Hence our obligation to the author for a master generalization in which science is made to seem but another manifestation of that Ultimate Reality to which the human spirit itself is kinsman.

MORRIS LLEWELLYN COOKE.

PREFACE

§A. *Subject matter.* — a. This book unifies or qualitatively solves science, religion, and philosophy—basing everything on experimental, verifiable evidence. The explicit meaning of that statement is given in Chapters I and II. No assumption is made (as is shown in §22).

b. The book is a condensed, preliminary rough draft of that unification of knowledge. All the qualitative problems set forth by the race—by "religion, science, and philosophy"—are herein positively, definitely, and verifiably solved. But the application of those solutions consists of quantitative

problems; and it is shown that *no* quantitative solution may be *accurately* expressed or given (§§25, 40-1, 50, etc.); also, such solutions are infinite in "number" and may not be even roughly expressed in a finite book. Hence, merely general methods of the application of qualitative solutions to the problems of *how much?* and *how many?* are given. And only in so far as the reader is able to understand, verify, and apply those methods to *his* life has the book any value to him. As each person differs from others (§§162i-j, 167m, 168p, 170p), the best book for one reader truistically can not be the best for another. So this book can not possibly be final, or the last word; other men can continually rewrite it better, wholly or in part. And most emphatically, I propose to no reader any creed, or "theory," or "system" of truth, or ritual of any sort. As will be seen (Part One), all such are merely passing conveniences, tricks with words—and each reader may best select his own words.

c. The prime purpose of the book is to substitute positive knowledge for that aggressive ignorance which is named agnosticism—thus eliminating agnosticism, the current prevailing "ism." The accomplishment of that purpose results in raising the standard and content of living—gives "life more abundantly" (Chapter XVIII, on ethics).

§B. *To whom addressed.* — a. The book is addressed to the general reader who has a fair education. Each subject is treated with the rigor that will, it is hoped, satisfy the experts in that subject. But because the book includes all branches of knowledge, probably no one of the present day would be competent to read it if it were written in highly technical terms, and gave the minute details of each branch. I certainly should not be. So in order to satisfy all the experts by giving each the complete grasp of his subject which truistically includes knowledge of its relations with the subjects of other experts, it was necessary to avoid all but fairly common technical terms, and to omit unnecessary details. And that is equivalent to addressing the general reader.

b. That reader, as will be shown implicitly throughout Parts One and Three, is quite competent to judge the validity of this book. There is nothing esoteric or "hard" about the book in general. It is merely a description of things as they are. However, it requires some work to read the book. Some effort of attention will have to be made in places.

c. A competent scientist of wide and successful experience in writing for the general reader tells me that people tend to be frightened away from a book that uses mathematical equations. I show that such a distrust and dislike of mathematics is justified, and an evidence of the wisdom of people in general: conventional mathematics contains fundamental errors (§§30, 43-4). I remove those disabilities of conventional mathematics, and then use a few algebraic equations which even the non-mathematical reader will nearly surely approve, so obviously do they economize his attention. —— I may add that the publishers I tried seem to disagree with that: the reader may judge whether they underrate him.

§C. a. There is no originality in this book in any real or important sense. Possibly some combinations of ideas are partly new. But I myself have definitely found nearly all, even of the wider combinations, previously advanced by others.

b. Consequently, the reader need not anticipate being repelled by any novelty or heresy of any importance; even when at first there is some slightly distressing apparent novelty, in the end it will turn out to be obviously an old belief. E. g., it is shown that the earth is cold inside (§122i). That does not happen to be the current conventional belief. But it was a common view in the past; and if the reader will examine his views he will probably find that he has no more real love for a hot inside than for a cold inside—but prefers, as the important thing, the actual facts and the absence of self-contradictory views. The perspicacious reader will soon discover that I am very conservative—avoid being either radical or reactionary.

c. As there is no real originality in the book it follows that I am indebted to others for the ideas set forth. I gratefully acknowledge that debt; but those creditors are so numerous that I can name none without injustice to many whose names I do not even know. In even greater measure I am indebted, not only for ideas I have used, but for what is more, personal aid and inspiration, to my wife, Laura Kent Klyce, and to Frederick W. Taylor, David Starr Jordan, John Dewey, T. W. Richards, Dorothy Canfield Fisher, J. J. Thomson, and Gerald Stanley Lee.

§D. a. Some personal remarks may interest the reader, and will give needed information:-

b. In the early summer of 1914 I finished a book that contained substantially what this one does. It was too long, and contained literary defects quite too atrocious, for publication. It ran to about 700,000 words. Since then I have written it over in whole or part continually—having much of that competently criticized. That work is here condensed into a volume of reasonable size—I have struggled to keep it down to 250,000 words (it has expanded in two rewritings and probably will be about 325,000 when I finish setting it up: this page is done in the middle of that job). That almost violent compression of such an obviously extensive subject was necessary chiefly because a long book in this day of many good books frightens away readers, and because with a subject of such a nature a long book would tend to have 'so many trees that it would hide the forest' from the view of the few who might have braved its length.

c. The reader can of course understand that it would have given easier reading if some of the book had been expanded into smaller and more familiar detail. But the almost imperative need of brevity, which has just been pointed out, has required the sacrifice of such ease. Quite possibly no reader will be satisfied with the actual compromise that has been made between such brevity and such local easy intelligibility. The most difficult thing about the actual writing of the book was to make that needed compromise in a way that was even tolerable to the reader—to conserve both his effort of attention and of memory.

§E. *Typographical and similar formalities.* — a. Certain arbitrary printing styles, which are not always used, have been followed in this book. An explicit statement of them here, if the reader keeps the statement casually in mind, will save his attention.

b. The argument unifies knowledge. Consistently with that idea, often when I have a formally plural subject, in my view it is clearly unified, and I use a singular verb—sometimes oddly. Always in that as well as in other grammatical constructions, I try to be conventional and hence inoffensive. But when explicitness and clearness of expression seems to require it, I deliberately sacrifice formal grammar.

c. All names of books, articles, etc., are put in quotation marks.

d. All algebraic symbols are given in italics.

e. All words, used *as words*, are printed in italics; no quotation marks are placed around them unless the custom for such marks (stated in the next paragraph) also applies to them. Italics are also used for emphasizing a word or words whenever it seems to me to make the text the least bit easier to read. It would of course always be possible, by ingenious literary circumlocutions, surely to indicate the desired emphasis without that mechanical use of italics. But the keen reader will appreciate the brevity secured by italics, and will

readily perceive that I compliment him by taking it that he does not need the literary flattery I could give him by letting him waste energy finding the emphasis. This is not a book for stupid readers, who require even literary flattery.

f. Quotations of others are marked thus:- " ", etc.—in the usual way. Quotations of myself are marked thus:- ' '; and such 'quotation' usually consists of my use of some word or phrase in a temporarily unusual sense. The " " marks are similarly used at times to emphasize or indicate that I am using a word or phrase quite conventionally.

g. This double mark :- is used "to introduce something that the previous sentence or clause has definitely prepared for and led up to," so that it just precedes some remarks that are to be expected. The ordinary colon : is reserved for its other ordinary uses. When the :- is followed by a word beginning with a small letter, it introduces merely the remainder of the same sentence—when by a capital not otherwise needed, the remainder of the paragraph, etc.

h. Economy of attention requires the conventional mechanical device of treating a single topic in a "paragraph." Sometimes in this book such a natural topic needs a lengthy paragraph which of itself contains sub-topics. If the long paragraph were split into paragraphs to indicate its natural subdivisions, it would, mechanically, at first give the reader the erroneous and confusing idea that the chief topic changed. So I split it into 'little paragraphs' by a dash ——.

i. Most algebraic 'symbols' used in this book are conventional initial letters; but some are whole words. A list of those symbols, etc., is given as Appendix A. —— The chemical elements and periodic table are given as App. B.

j. The symbol ... will be reserved for the single meaning:- a continuing series, or infinite regress (§86n). An omission in a quotation, which often is indicated by that symbol, is indicated by ***.

k. When I needed to state the source of a quotation or idea, or to indicate where fuller or analogous expression or proof is given in this book, I have tried to avoid that distracting and chopping up of the reader's attention which would have resulted from putting the reference in a footnote in the more usual way, by putting it directly in the text in an abbreviated form, where the eye can recognize it at once for just what it is, and yet inattentively slide over it unless it is to be definitely used. For similar reasons I have tried to get along without footnotes. Only when a needed parenthetical statement seemed to make too violent a break if printed in the text, have I put it as a footnote.

l. In preparing to set up this book myself I read several books on typographical rules and practices. Then I followed that practice which I thought would least intrude itself upon the attention of the usual reader, and at the same time would cost him the least money. When there were two ways, apparently equally good, I have used both ways—that giving variety which I trust will please the reader as much as it did me, and relief from remembering arbitrary rules, and a trial of different ways to see if some actual preference develops.

§F. a. The reader may be interested in remarks on the form of this book and the reasons for printing it myself:-

b. I finished what may perhaps be called the present version in the spring of 1919 (it has been twice rewritten since), and started to look for a publisher. I quickly found that publishers were, so far as I could tell, afraid to risk anything on their judgment of the soundness of the book. So I proceeded to get introductions by leading authorities in the three main sorts of knowledge to vouch for its soundness.

c. While continuing trying publishers I tried a number of endowed institutions and similar organizations formed for the purpose of advancing knowledge in one way or another, to see if they would help get the book published. So far as I could judge from their evasive but usually verbally cordial letters, they believed the book couldn't be sound—not one would even look at a manuscript. There was one illuminating exception. I began corresponding with R. S. Woodward, a scientist then president of the Carnegie Institution of Washington, in December, 1919, and continued until he ceased to be president over a year later. Woodward made a speech to the Congress of Arts and Sciences (convened at the St. Louis exposition in 1904 to try to unify knowledge—spending about $137,000 in the attempt), on the first page of which he said in effect that a book like this is practically impossible. He steadily, with a few exceptions in which he tried safely to dodge my introductions by men with reputations of the highest, asserted in effect that he didn't believe I had a sound book; and steadily refused even to look at it. He repeatedly referred me to his remarks on writers of what he in effect claimed were similar books (in the Year Book, 1917, of his Institution, 21-7), which include these epithets:- cranks, quacks, aliens, charlatans, mountebanks, arrogance, audacity pushed to the extreme of mendacity [that's a nice phrase]. I began to think, after reading his letters, that if my book was sound it must have extraordinary value. But on second thought I decided that more likely Woodward was a little timid in the presence of an idea.

d. I of course went over Woodward's head to the Trustees of his Institution twice. As soon as Merriam took on its presidency the first of this year, I renewed my request to him and he asked for a manuscript, and for months examined it and had some of his colleagues examine it. After I found I would have to wait for a decision I began to print the book myself (see next par.), and asked the Institution to buy 350 copies for distribution to the libraries on its free list. They are still deliberating on the matter.

e. I tried 18 publishers, and they were afraid to take the commercial risk. It is a common practice for authors of books to take the money risk. So I finally had a reliable publisher give me his lowest offer:- it was that I pay $10,000 for an edition of 2500—$4 a copy, to sell for at least $6 and probably more (if I had printed 2500 I could have *sold* them for $1.50—and more, still lower). I didn't have $10,000. So I tried to borrow it on substantially a mortgage on the book, from 25 successful business men, they to have the additional satisfaction of helping advance knowledge. About one quarter of them showed genuine interest; and I am pretty sure that two or three would have advanced the money if I had waited until the present low-speed panic (footnote 168h) is over. Those business men recognized at once that I was honest and probably right (Index, "Sizing up men"). But I decided that the book had waited long enough.

f. I spent three days reading about a dozen books on printing—they were fascinatingly easy reading,—and then about four more reading catalogs and looking at printing supplies and talking to printers, and buying the cheapest second-hand plant (new type), and supplies for an edition of 1000. I have tried my hand a little at being a machinist, a plumber, and six or eight other trades, as I had to handle men in those—and at playing golf. And printing is the easiest—and to me more entertaining and gentler exercise than golf. (Of course, my effort was chiefly to print a passable book at the lowest cost; e. g., there are two or three pages printed poorly because I deliberately would not use time waiting for the humidity to drop and hadn't learned how to counteract it satisfactorily: and there are too many typographical errors left in, due to not spending an extra hour on each page.) It took me a week to print the first page (p. 1), although I had picked up a little printing as a boy; the second took three

days. The last half of the book was printed about eight pages a week, and once nine. I could have gone faster if I had not taken plenty of time to revise the book—to think it over and rewrite as I set it up. That revision was the only real work, except I would occasionally use my head a little to overcome obstacles that printers assured me couldn't be overcome. Printing one's own book is the best method of revising it I have found; it gives more time to think over each word, and a very gratifying and useful sense of responsibility—there being no assumed-omniscient editor to rely on. Anybody with sense enough to write a readable book can learn to do passable printing in a week (of course, printing, or any other trade, can be made a fine art, and a lifetime be profitably spent on it; see §166f).

g. These are the costs per copy, estimated fairly closely:- Plant and supplies (net, after selling them at the price tentatively offered), 17 cents; paper, 28c; binding (by a commercial binder), 25c; ink, 1½c; engravings for pictures (they are poor, I having made the mistake of getting them from a high-price firm), 5c; transportation, 2½c; selling expenses, insurance, etc. (circulars, postage, free copies for publicity purposes), 4c. That makes a total of 83c. Then my work costs:- author's royalty at 5 per cent, 10c; publisher's profit, 7c; my labor, at $25 a week, $1.00—making the total of what I get, $1.17, and the total cost of the book, $2.00. —— I have charged labor at about half present printer's pay. Judged by present prices of farm products, that is probably more than a printer is worth. But if a regular publisher had printed the book I would have had to use fully half as much time on it [and five times as much nerve wear and tear] as I did to do the whole work: and by that criterion $25 a week is more than it sounds. And the plant net cost figures out as a depreciation of 70 per cent a year. A regular publisher of course would not have such an extreme depreciation; so he could afford modern machinery, which is supposed to be five or six times faster than the hand methods I had to use. My "overhead" is itemized above, and contains every legitimate item except rent, heat, and light—which would have been less than 2c if I had included it. The supervision and thinking for the job is included in the dollar for labor; it was less than a millionth of the work of writing the book, so I am getting overpaid at that. Books of about the number of words of this nowadays retail around $10.

h. As that $2 is the lowest legitimate price, I had to annoy buyers by adding postage. Few know what zone postage will amount to, and the buyer is frequently consciously irritated by any price which adds postage. But there is a difference of as much as 600 per cent in the zone postage for this book—which makes it scarcely fair to buyers to average it, as the difference amounts to 16⅔ per cent of the net cost. —— I doubt if there is in fact any such wide divergence as that 600 per cent in actual cost of postal transportation of small packages; if not, then the present rate is unfair, as well as being a nuisance.

i. I find that some readers want to buy their book at a book store. It costs me no more to sell a book to the reader direct than it does to a dealer, and I find it far more interesting and pleasant to deal direct. I first offered the book "by subscription" at $2 and postage, in that conventional way announcing my intention not to sell at any less. If the reader prefers to buy at a book store, I am of course pleased to have him suited; but naturally he should pay the dealer something for his trouble. I am told that usually the dealer adds about 40 per cent of the cost of the book to him, as the price of his services. So as a mere empty form I have put the retail bookstore price at $3: I have no legal control over the dealer's price. At that price the dealer will perhaps get about 40 per cent increase on the cost to him—and incidentally he will get nearly as much for selling the book as I do for labor in selling and making it. Perhaps his service is worth that to the buyer: the buyer can judge that better than I can. —— Of course, if the dealer were doing *me* any appreciable service in selling this book I would sell it to him lower than to others. But there are only 1000 copies, and I do not want them sold to people who have to be urged in any way to buy; and the slight publicity which dealers could give the book would probably be undesirable. And naturally, if the dealer thinks that what he does for the buyer is worth the price, he will be as anxious to tell him the cost as I am, and will be grateful to me for having largely done it for him. And of course, if any dealer really wants the buyer to get satisfactory value for his money, that dealer will be glad to have the buyer accept my price if more satisfactory. So if any dealer objects to anything in this arrangement he thereby demonstrates that he is a profiteer, selfishly trying to deceive and grab something for himself without giving equal value in return—and I am glad to have gained his ill will. I make these remarks because my stand in this matter has already been attacked—that giving direct evidence that they are needed. (For theory of middlemen, see §170o.)

§G. a. It is the opinion of those who are probably the best judges that a book is an actual commercial success if it is intrinsically interesting and so is recommended by one person directly to another. I shall spend no money advertising this book, and make but a negligible effort to give it publicity. I think the book is a useful one and worth reading—rather more so than the ordinary book. If the reader concludes that it is worth reading, he would, if he is right, usually be useful to his friends by recommending it to them. And his doing so would be ample compensation to me; for if the book *is* useful, thus I shall in due time get paid for the several years I have spent on it (principles of payment are in §168). If I have an opportunity I shall inclose one or more circulars in the books I send out, for the convenience of those who may want to use them.

b. I find by experience with various people that, because there are so many stand-patters who consider a sound book of this sort impossible, it takes unusual courage to recommend it publicly. So judged by that evidence the men who wrote the introductions have displayed that fundamentally essential trait in the degree that is leadership (§§170r, 167b).

S. Klyce.

Winchester, Massachusetts,
September 17, 1921.

INTRODUCTORY REMARKS

CHAPTER I. *Summary of contents and their character.*

§1. a. This book is a brief description, and rigorous proof of the truth of the description, of the universe and all that appertains to it, both "spiritual" and "material." Hence, the book is religion, science, and philosophy. If those three names of the main "branches" of knowledge are taken in their customary senses, I am unable to determine which name properly designates any given portion of the book. The three are actually unified.

b. But although all three branches of knowledge are thus included, one general method is rigidly and without exception adhered to:- all statements and conclusions are based on experiment, so that the reader may also verify them by his own experiments or experience. When such a *method* is used, the product nowadays is usually called science; but in that case "religion" and "philosophy" become identical synonyms of "science." Personally, I have no preference in that matter of names; simply for convenience the three terms are hereafter used as applying respectively to the three possible and conventional *ways of expressing* the same thing (§39).

c. Although everything is to be experimentally verifiable, the description is not therefore "materialistic." In all conventional fundamental senses this book is far more definitely idealistic than are (say) the doctrines of Plato or Berkeley or any orthodox theologian. The leading scientists of the present day, such as Richards, Jordan, Chamberlin, Patten, Hale, reach conclusions the opposite of materialistic, as we shall see (IX, X). It is at the same time quite true that some of the men who claim to be scientists have been materialistic, and have damaged the prestige of science with intelligent people. Later we shall see explicitly how such men as Ostwald, Clausius, and other Germans have been materialistic, and hence wrong (see especially §147).

d. But the argument of this book, although idealistic in the popular sense (§49, etc.), is not sentimental; it has more than the conventional mathematical rigor. For conventional mathematics are defective (§44), and the argument is given with the rigor of a properly corrected mathematics.

§2. a. We may first view the book as a whole by noting how it compares with conventional "science." The brief statement of such a viewing is that we shall find present science to be quite correct essentially, except that it is incomplete—as is of course acknowledged by most scientists. So it is completed, in a qualitative sense. In many cases we shall find that science reaches what are customarily termed religious conclusions. As strict science those conclusions are wrong in the sense that they are mislabeled and misapplied. Thus, the so-called law of conservation of energy is quite true; but it is religion, and not science. Or, to give a more directly concrete example:- Newton's law of gravity is correct as pure religion; but it is wrong, both in principle and qualitatively, when applied to any two ('scientific') bodies such as the earth and the sun (§§74, 73d, 83f).

b. But that statement of the scientific aspect of the book is perhaps too broad to be comprehended at this point. So we may take a more concrete view of science, and note just how it is proposed to complete science.

c. Careful mensuration is considered to be the proper basis of present science. Kelvin declares that "nearly all the grandest discoveries" of a legitimate, valid science have been "the rewards of accurate measurement and patient, long-continued labor in the minute sifting of numerical results." —— I substantially quote this paragraph from Richards (Faraday lecture, 1911; "Science," N. S., 878).

d. The last paragraph asserts in effect that experiment or experience is the correct method of getting science, and then states the best method of experiment:- careful observation or "measuring." (Later I prove that the assertion is true; see especially §§38-9; also 36-7, 57, 59, 60, 150.) But the use of that method by no means exhausts what science must do, and actually does do:- it is obvious that whatever is obtained by those experiments must be expressed, stated, communicated, classified—and *is*, before it is even known as science.

e. So we investigate the expression—the *consistent* expression, or classification—of experiments, basing that investigation itself and consequent conclusions upon experiments or concrete evidence. (It is a "*circular*" process.) That investigation permits us to complete science. We promptly find that the fairly well informed average man is already in possession of enough "experimental" data to complete science, as soon as we derive a consciously definite and consciously consistent method of expression. Hence, it follows that the reader needs no wide acquaintance with "scientific" or "technical" details in order to judge the general truth of this book. However, some scientific detail is included for the use of those who need it, and to show the general reader the further implications of his present knowledge.

f. We shall find that there is a mere verbal trick which enables us to complete and unify all knowledge; to solve, verifiably and self-evidently, all qualitative problems—all problems of why, how, what, or all principles. We shall find that we already constantly use that verbal trick, but merely have not definitely noticed it—that it is an absurdly simple trick, the use of which is ordinarily named "commonsense" (§49l). The application of that easy trick to the thousands of details of daily life sometimes requires the consideration of such a number of things that it is difficult to remember them all, and we say that such application is *complex*. That is the only actual difficulty we have in "understanding" anything. A child can "understand" the "argument" or "reasoning" of this book. I have tried it on children of six and they did. The reader already knows the argument (§49q).

g. Now, Kelvin himself elsewhere clearly implied that the expression of science is defective. We have him complaining:- "Quaternions came from Hamilton after his really good work was done; and although beautifully ingenious, have been an unmixed evil to those who have touched them in any way, including Clerk Maxwell" ("Life of Lord Kelvin," 1138; quoted from Shaw, "Philosophy of Mathematics," 98). Maxwell used quaternions to express the theory of electricity that is still substantially used. So it is clear that there is more to science than measurement.

§3. a. The last section implies that mathematics is the means of expression used by orthodox science. So we may view our book from a mathematical aspect.

b. We noticed Kelvin objecting to a certain sort of mathematics that is explicitly used in a large part of science. Somewhat contradicting Kelvin, it would be easy to quote a number of scientific writers who substantially hold that those without a knowledge of the so-called higher mathematics can not understand many things that are true about the universe. We shall see that those writers are wrong.

c. The fact is that mathematics is simply an abbreviated method of expression—a formal shorthand language (§30). It is based on precisely the same method or trick that ordinary speech uses (§30). Orthodox mathematics itself contains a fundamental inconsistency or self-contradiction. The mathematicians themselves admit that it does. Russell ("Ency. Brit.," xvii, 881) shows it, and says it may be removed in a certain way; but Shaw ("Phil. of Math.," 77-8) substantially disagrees that Russell removed it, and quotes Poincare, one of the most renowned of recent mathematicians, as despairing of mathematicians' ever agreeing on it. So it is clear that mathematical authorities themselves imply that orthodox mathematics serves to confuse science, rather than give it any fundamental intelligibility.

d. As orthodox mathematics are afflicted with such inconsistency, I shall as a general rule not use some branches of them. It will be shown in general how to correct—more accurately:- complete—them. But this is not a book on mathematical detail, and extended revision of mathematics is omitted. It will be shown how ordinary algebra, when used in a consistent way, gives highly abbreviated expressions which we can easily keep in mind: a short formula will summarize the whole verbal trick. So we use that formula, derived in §§33-8.

§4. a. The consistent expression of experience is conventionally named *logic*. The mathematicians call substantially the same thing *logistics* or *symbolic logic*. The trick of language, or the theory of language, will therefore be given that conventional name *logic*.

b. That name has a formidable sound. Orthodox logic *is* formidable, as it is quite unintelligible if taken at just what it says. (That means the ordinary textbook logic; there are several valid treatises—§49o-q.) But valid logic is excessively easy—precisely that: so easy that such logic was usually taken for granted and overlooked, so that we have had such monstrous books as Kant's "Critique of Pure Reason." The fact which we shall find (§49) is that the average man has been using the valid logic right along, and that it is very simple as soon as we are conscious of what it is. —— We are not going to trouble ourselves with syllogisms, and other such horrors of our school days. In fact, we are going to see that in the conventional senses there are no such things as "logic" and "reasoning."

c. We shall readily see that the well advertised "mystery that shrouds the ultimate nature of the physical [also spiritual] universe" is nothing more than our previous more or less unconsciousness of that trick of verbal expression which we continually use. The mystery and the "Veil"—all "Unknowns," and especially "Unknowables"—simply turn out to be the things we really know best, as soon as we see just how we have been talking. Valid logic itself has the characteristics of a "machine" (VIII). So the puzzling "mechanical" aspect which the universe seems sometimes to take is an aspect of the verbal *method* used to describe it.

d. Hence, this section and the last merely assert that, both from the conventional point of view of science and of mathematics, by using a simple trick or *method* of expression or language, we solve all qualitative problems.

e. I may add here that always we have to solve *quantitative* problems—*how much?*, *how many?*, *when?*—for ourselves as we go through life. *Never* can such problems be solved *accurately* except by actually "living" them. The qualitative solutions given in this book do not take away the need of continually solving such problems of actual living, and it it rigorously proved that never can such problems be otherwise solved (§§25d, 40-1, 50, 167, 173; cf. §66g). So no one need fear that this book or any other is ever going to remove from man all need of mental effort, by solving all qualitative problems. It sounds paradoxical; but we shall see that it is quite simple (III).

§5. a. From the point of view of actual life the idea or result or purpose of this book is to prove that man knows all qualitative truths—thus absolutely destroying agnosticism and kindred views. In short, for everyday living, the book replaces ignorance with knowledge. It will be shown that ignorance is the only "sin" or source of pain (§164c); and "faith" and dogma, by their very definitions, acknowledge some degree of ignorance, and are sins. However, it is to be emphasized that the actual facts, the verifiable truth, dictate that purpose of the book—not any arbitrary fancy of mine. In no instance do I indulge myself in any "purposes" and "aims," in the vague conventional sense of inexplicable or truly primary or uncaused desires—for all kinds of absolute "purpose" or "First Cause" or teleology are proved to be wrong (§§86d, 144h, etc.). In all cases the facts govern: I personally, as the writer, merely record; and the reader observes and discovers for himself. I am not an "authority"; the universe as a whole is the real authority. I do not preach. I "urge" nothing on the reader, and do not so much as "invite" him to do anything. I do not dictate in any way.

b. In many places hereafter we see that the point of view set forth in the last paragraph agrees with things as they are. Here, I may show in rough physiological terms that agnosticism is damaging:- If the nerves controlling the beating of a man's heart were to become 'ignorant' or agnostic of just what they were doing or 'wanted' to do, then as a truism they would be vacillating, uncertain, unreliable; and if they were really agnostic or quite ignorant—and not just partly or 'formally' ignorant,—they would as a truism stop working, and the man would die. But even the minor vacillation would be "heart disease." Obviously, if his "higher" nerves become really agnostic, they stop working, and he is partly dead. He would, as a truism, die wholly if he actually were agnostic about everyday living. —— We shall see that no one is really agnostic: people are ignorant only in a quantitative sense, and not in a qualitative sense (§§25, 49). Also, agnosticism in practice is turning out to be a favorite disguise of the dogmatist, obviously saying this for him:- "See how very modest I am in admitting ignorance. You ought therefore both to praise me for being modest, and also unquestioningly to believe what I assert I know, as that modesty proves my reliability." —— I shall implicitly show in this book that an assertion of ignorance requires as much proof as one of knowledge; that it therefore by no means follows that such a dogmatic agnostic is either modest or reliable.

c. But because the method of using language rigorously has previously been somewhat unconscious, although the conclusions got from the method were consciously called "commonsense," there actually are what we might call quantitative agnosticisms—partial qualitative ignorances, sins, pains, or partly dead nerves. The removal of those defects will truistically give "life more abundantly." The reader himself, by his own efforts in observing things as they are, gains for himself that more abundant life, as explicitly described in Chapter XVIII on ethics.

§6. a. It is difficult to give briefly at this point any easily intelligible summary of the religious conclusions which are to be established. That difficulty exists mostly because of the fact that theology is customarily considered to be religion, whereas orthodox theology contradicts religion, so that there is great confusion in customary terms for this subject. Another difficulty at this point is that it is not customary to consider religion as being a definite, verifiable matter.

b. Probably the clearest way of summarizing the religious conclusions that will be established is to state that the average American in his everyday life or work, and as the sum total of his thinking about it, has substantially achieved a true religion (§166e). Or, the sum of Christ's doctrines is valid. On the contrary, the "reasonings" and exhortations of professional theologians are usually not sound religion.

c. Perhaps the only explicit remark on religion which will be of much service at this point is that the theologians, in so far as they are explicit and not evasive (§48b), mostly teach Paulineism and not what Christ taught. It will be shown that Paulineism diametrically opposes the truth, whereas the substance of what Christ probably taught is correct (§§160-3, etc.). Considering them as men, I think theologians vary as do other men. Some are objectionable to me, while others are personally very fine. But taking them professionally—and unless otherwise noted my remarks refer to them professionally,—they are substantially wrong, and I am opposed to them (§§169d, 177b).

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§7. a. The foregoing summary of the book from five points of view may unintentionally lead the reader to believe that what follows is perhaps almost exciting. But to most readers it will not prove to be so. It is more likely to seem at first to be rather dull and tedious. I have had some years of experience in giving the proofs and expansion of those summaries to various people—mostly to men with highly trained minds,—and the argument seems usually to depress them at first. However, occasionally it explicitly collides with some pet superstition of a man, and he gets quite excited. Ordinarily, though, this unification of knowledge is disappointing. It may be useful to the reader to have me point out the general causes of that possible temporary disappointment:-

b. (1) Many generations have been inventing pleasing yarns concerning the delights of having absolute knowledge. In the absence of having such knowledge, even now men often assert the existence of it in some future heaven. But apart from such rosy fairy tales, for generations even the responsible thinkers in their speculations have rather overrated the benefits that would immediately accrue from the possession of absolute and complete qualitative knowledge. So naturally the reader will be expecting too much. If he could discount those expectations about 95 per cent right now—which will probably be practically impossible,—he will not be disappointed.

c. (2) The next particular source of disappointment will be that the reader already knows the essential conclusions that are reached. As I have reiterated, I do nothing but use a verbal trick consistently. The reader does nothing but discover for himself that he already knows the essential truth. That will probably disappoint him at first, as it is not likely to be what he expected. For he may have the age-old, recurring idea that some Messiah, with mighty intellect, and an overpowering command of the disciples' emotions, would happen along and communicate undreamed-of, beautiful truths and happiness. It will clearly appear that such can never happen. The reader may resent the destruction of those expectations, the commonplaceness of the whole truth, and probably the commonplaceness of me and my ways.

d. (3) Because the reader actually knows the substance of our conclusions before he reads them, it follows that I am writing the obvious for him. About the most difficult thing to show is the obvious, as will appear. Peshaps it is even more difficult to see the obvious *consciously*—to observe definitely that we know it. "Philosophy" is the simplest subject there is. The difficulty with it is that it is *too* simple and obvious. Those unexpected things will perhaps exasperate and further disappoint the reader at first.

e. (4) The German type of materialistic scientist has taken Kelvin's phrase, "minute sifting of numerical results," as practically stating the sum total of any sort of valid knowledge. The German scientists of that sort so vociferously praised that idea that some others confidingly acquired the same delusion. If any such deluded person reads this book he will be disappointed—except that it is shown that in humanics (Part Three) there is probably not yet enough of definite measuring. For in this book there is added what the materialists omit, and what we have seen Kelvin himself substantially saying was needed (§2f). The book does considerable "minute sifting"; it is necessary, but it is only half the truth (the whole of Part One proves that).

f. (5) Finally, the reader is liable to be disappointed because I am too much lacking in skill in presenting the matter to him in the way he requires.

g. I know of no way, available in any practical length of time, of saving the reader from one or more of those possible dissapointments, or I would use it. If he has a youthful, vigorous mind—a condition not closely dependent upon calendar age,—it is nearly certain that in a few months, as the discoveries he makes gradually permeate his mind and become familiar, the disappointment will fade and he will find that he is extremely pleased, and really approves of things' being as they are. If the reader is surprisingly vigorous in spirit he may be at once pleased with the rigorous truth that the book proves. Personally, I am conservative, as was stated; and it took me a year or two to see the beauty of the truth.

h. But to the possible reader who is so unfortunate as to be rather firmly fixed or ossified in the habit of materialistic "science," and who requires—perhaps more or less unconsciously to himself—a long list of dry-as-dust obfuscating statistics, and nothing but such "facts," I can offer no pleasing hope. Both he and his mental brother, the persistently sentimental reader who prefers to believe much current theological and ethical dogma, will perhaps to their deaths mourn or resent that their beloved formulas have here been so plausibly questioned, if they rashly read further.

i. However, to the general normal reader I may offer another pleasant hope. It will be shown that the world or universe is correctly made. I am not a reformer, nor a grouchy pessimist—nor a Pollyanna glad-gamer. The facts do not permit me to be, as will be shown. On a basis of definite fact, I judge the present age to be the best age in history to live in, even though I consider people to be still very stupid. I do not think that I am as stupid as some people (I shall not ever bother the reader to praise me for having "modesty," as I have a negligible amount); but I find that I am enough like other people to prefer to associate with them—wouldn't feel at home among really intelligent people. So I like the human race very much on the whole, and shall not try to revise it. We are all on the way of acquiring more truth and hence more religion or life, or whatever the reader prefers to call the good we get. So the only panacea is experience—or in scientific technicality:- experiments. When we *consciously* get experience, we name it education.

j. Although I am thus correctly optimistic about qualitative affairs (§§149e, 161), in practical life I am able to see existing quantitative abnormalities, or unbalances, or undue departures from the average. I shall never bore the reader with any nonsense to the effect that everything in ordinary life is *quantitatively* good and lovely; for it is a fact that we (in usual language) say we dislike abnormalities in ourselves (usually calling them pains), and dislike to see them in

others; and such abnormalities sometimes do exist. From a *wider* point of view those painful things are good, and are needed; but we can definitely attain that wider view only by explicit recognition of that usual practical view of considering them painful (§177). From an immediate, direct point of view it is unpleasant to contemplate an extremely skinny man, and equally so to contemplate an extremely fat one; both departures from the normal or balance or the immediately pleasing are obviously dangerous to life, or limit life. The "upper ten" and the "submerged tenth" are abnormal, and when we come across them I shall not deny that they are. As we are getting a description of the universe, which includes all things, as a detail it will have to be shown that the I. W. W. and the domineering, profiteering employer *persistently* try to depart—in opposite directions—from the normal balance or the temperate life, from the democratic or religious life; and are truistically offensive. So it is with the materialistic scientist and his counterpart the dogmatic theologian, the militaristic Prussian and the totally nonresistant pacifist, the dualist and the technical mystic, the autocrat and the socialist, the aristocrat and the tramp, the closet philosopher and the "rough-neck," the "pure" theoretical man and the blatant "practical" man. In brief, we shall see (XVIII, XIX) that a democrat is a balanced, temperate, religious man; and rigorous proof will be given that such a man is the only sort who is happy and can possibly survive. It is proved with mathematical rigor that our Constitution is in agreement with that and with all natural law (XIX). So the book will be pleasant from a human point of view, provided the reader is none of those unbalanced sorts of persons. —— In order really to prove anything about humans we have to connect the proof consistently with "natural" law. So I connect it—or unify knowledge.

CHAPTER II. *Order and relationship of contents.*

§8. a. We have seen roughly the conclusions to be reached. I shall now state the order in which they are given, as that shows briefly their general relationship.

b. The portion of the book following these introductory remarks is divided into three parts. Part One gives a formal or general unification of knowledge, by showing the language trick. Part Two gives a unification in "concrete" terms of "matter"—or is physical science. Part Three gives the unification in "spiritual" or "mental" terms, and is the science of human beings, or humanics.

c. Those three Parts are briefly outlined in the next three sections. Here it may be emphasized that in *substance* all three are identical. I. e., each Part is essentially a repetition of the other two: the same principles are merely repeated in terms of different things—the essentials of *words* in Part One, of *matter* in Part Two, and of *men* in Part Three being identical. All the different "sciences"—the *expressions* of all aspects of the universe, of all modes of living, of all jobs in life—are merely repetitions of the same essential things. They are simply different points of view—quantitatively different expression—of the same thing, regardless of how widely different their names may at first seem to be. Obviously, such repetition is a truistic result of unification: for unification means the *ultimate* identity of all things.

§9. *PART ONE. — Formal Unification.* a. The first form of unification gives the verbal trick. The statement of that trick or method may with about equal accord with conventions be named (1) the theory of language, or (2) the theory of mathematics or (3) principles of mathematics, or (4) logic. And as I shall make a concrete model of language (VIII) which is a machine, the statement of that trick could also properly be named (5) mechanics. But as Part One does not explicitly discuss what are ordinarily called "concrete" things, that Part could also rather conventionally be named (6) philosophy. And also, because the language trick is found to be identical with what in theological technicality is called the Trinity, Part One might with verbal conventionality be called (7) religion. *Unification* itself means "consistency"; and as consistency is simply "valid classification," which is conventionally "science," Part One is also (8) science.

b. Thus it appears how unessential mere names are. I endeavor to use names in the way that is generally customary. But as soon as we begin to get a real understanding of things, names begin to coalesce—sometimes with such persistence that even temporary verbal distinctions become hard to hold.

c. Obviously, so far as *formal* completeness is concerned, I might end the book with Part One. For it essentially unifies knowledge. But so far as that goes, knowledge is also completely formally unified in the first few paragraphs of Part One (§12). We need further repetitions of the unification as a proof that actual unification is possible (cf. §35), and in order to get directly applicable conclusions. For centuries there has existed a formal unification in the word *God*, or in the word *universe*—and neither unification has practically proved to be very applicable, or intelligible.

§10. *PART TWO. — Concrete Unification.* a. Consequently it is proved that mind and matter are identical (§§46, 150), and our unification of knowledge is explicitly shown in Part Two to hold good with respect to "matter."

b. The doing of that constitutes physical science. We shall see that such science is very useful for our purpose because its terms permit us to be definite. And its concepts are simple, and hence easily grasped. So it is excellent as an introduction to the difficult science of humanics—difficult because of the numerousness or "complexity" of its details, which are hard to hold clearly in memory. That physical science is also directly useful of itself, as it is an intelligible description of the "environment," which we continually use.

§11. a. *PART THREE. — Spiritual Unification.* a. The last part is another repetion of consistent knowledge, given in terms of humans. That final repetition is crucial proof that matter is mind—it being the actual consideration and use of matter as such in a way that obviously agrees with the facts.

b. Part Three is, practically, the direct application of a unified knowledge to our immediate interests. It is familiar, and can be used by everybody—is used, in fact; for I merely describe how people act. In Part Two we see that every atom, our solar system, our galaxy—every so-called material thing—is a live personality with actually as many traits or "properties" as a man. But in physical science we can not see those traits so well; hence in each sort of "material" structure we explicitly consider only the few outstanding properties. And that "simplicity," which is really meagerness, permits us to work up gradually to a consistent grasp of the numerous perceptible properties of men. But at the same time, much of Part Two is unfamiliar and "uninteresting" to the general reader simply because those properties of atoms have not been conventionally named like the same properties in humans, and so atoms are not at once recognized from the very names as being like himself. The general reader will hence necessarily find Part Two to seem somewhat "abstract" at first. There is no need that he try to remember Part Two. But at least a casual acquaintance with physical science is needed for any actual understanding of ourselves, as we shall see at some length.

c. In writing Part Two I have tried to show that most of it is of immediate interest to us, and to remove its verbal abstraction. But it is written with all the fundamental rigor I could put in it, as is the rest of the book. Nothing has been "prettified" or sugar-coated for a lazy mind. Throughout I omit many details, the explicit statement of which would serve more to complicate than it would to forward the main thread of thought. Many such details I know; but I am quite aware that there are enormously more of which I am not explicitly conscious—although the argument, as is proved, implicitly includes them all. But everywhere the book is written "up," in an attempt to equal in worth the work of the best experts in each particular subject, and to interest them. However, the normal reader will find that he is quite my equal in most subjects and superior in some, if he will only take his ability for granted, and ignore the superstition that there is something esoteric and appallingly recondite about ultimate knowledge.

PART ONE

FORMAL UNIFICATION; or THEORY OF LANGUAGE

CHAPTER III. *Nature of the general problem and its conventional name; or, what apparent failure in unification requires reconcilement.*

§12. a. In this section we shall see in a brief, concrete form the whole trick which definitely unlocks all truth. After that I shall prove the need of such an unlocking, and then begin in a more comprehensive and generally applicable fashion to express and apply the trick.

b. Without stating the proof explicitly, it still will be rather obvious that we may make a typical form of statement or *sentence*, thus:- 'Two things plus [or:- and] three things are equal to five things.' —— We may abbreviate it, thus:- 'two and three are five.' Or we may abbreviate it still more:- '2+3=5.' The only other general form of statement is what is called the *truism*, in which both sides are explicitly identical, as:- 5=5, *A* is *A*, *A*=*A*. Later we shall see that all true or-and intelligible statements can be reduced to truisms (§§35-7); we can see at once that our 2+3=5 is really the same in meaning as 5=5. Most of the sentences we use are obviously but slightly removed from being explicit truisms. E. g., *John is a boy* means that *John* [*whom I know to be a boy*] *is a boy*, or *Boy*=*Boy*. Or, we could call "*boy*" a "class," and finally get the truism in the general form, *One unit* [*who is named John*] *is one unit* [*in a collection or class named* "*boy*"]; or, 1=1. But we need not go into that here. It was mentioned merely to make it reasonably obvious at this point that, unless we make sentences which are explicit truisms, the general form is 2+3 =5. And that sentence is itself only one step from a truism, as noticed:- for the first member, 2+3, is obviously 5, and we have, 5=5.

c. So we start with merely the general form of statement, in an abbreviated form:- 2+3=5. In the first member of that, we have *two parts*, '2' and '3'. I. e., the first member implicitly asserts that there are *two* collections of things, which collections are at least *verbally separate*. The last member of it asserts that there is only *one part*, '5.' I. e., the last member implicitly asserts that there are *not* two collections of things, but that there is one collection *not* verbally separate. In short, so far as *form* or *language* is concerned, the last member *formally contradicts the first*. Hence, in our typical sentence, we say a thing is so; and then promptly, and as a part of the very same sentence, say it is not so.

d. Well; by all conventional views of logic or "reason" our typical sentence is thus verbally or formally positively and completely illogical and irrational, as it says one thing and then at once says it is not true—as it flatly contradicts itself. But by ordinary commonsense—by direct observation or experience—we know that the typical sentence is correct or true. In fact, a proverbial symbol for obvious truth is the statement 2+2=4; and I should have used that, except we needed to distinguish one 2 from the other 2, and it is hence rhetorically less awkward to use 2+3.

e. Therefore, we simply use observation or "commonsense," and conclude that orthodox logic or reasoning is wrong, because 2+3=5 is correct. Then we further conclude, as being the total essential of a valid logic, that in any sentence—i. e., completely stated and *intelligible* sentence—which is not a truism of the form *A*=*A*, we *must* have a formal or verbal "contradiction," in the respect that *parts* are asserted both to be *parts* and *also* to be combined into a *whole* which is *not* parts. In fact, we may readily see that to make such a "contradiction" is the whole purpose and use of language:- to combine parts into a whole: to make names of parts coalesce into a *formal unit* that *means* the whole. —— That states the essential of language and the whole verbal trick. We *apply* that trick, and thus unify knowledge, by adhering to the simple rule:- make sure that the valid—or "rational," or "true"—sentence does contain such a formal contradiction; if it does not, and is not a truism, it is really nonsense.

§13. a. That is the sum total of the essentials of valid logic, and it implicitly contains the solutions of all qualitative problems. The last three paragraphs express all the real argument of this book, and there is nothing in all of knowledge any more difficult to understand than those simple observations. The reader knows that logic already. He uses it daily, as "commonsense," without even having to "think" about it. He is so expert at it that he would find difficulty in saying how he does it, just as he would find (perhaps much less) difficulty in stating precisely what motions he makes in putting on his clothing. Below in this book I merely point out the details of that familiar logic, and the reader verifies them by his own observation and discovers that he knows all answers to questions of principle.

b. So I now begin to translate that simple argument into the various aspects of it we have become accustomed to use.

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§14. a. As we proceed we shall see in more and more detail that the formal contradiction occurring in that simple typical sentence is inherent in positively all knowledge or expression. I shall state in this section some of the more general aspects of the contradiction which have been recognized, often for centuries (also cf. 5th and 6th paragraphs of Dewey's Introduction).

b. For each one of perhaps a thousand points of view that contradiction already has a definite conventional name. The "philosophers" long ago (they were the scientists of those days) named the formal way of speaking of parts—e. g.,

of our '2' and '3'—the *Many*; and the formal way of speaking of the whole, the *One*. Or perhaps mostly, they called the parts themselves, the Many; and the whole itself, the One. Usually I shall not need to be explicit about such a distinction between *parts* and *expression* of parts, etc. (cf. §36). And when the philosophers had assigned those names, some asserted that the Many was "real" or the "truth," and the One false or "seeming" or "appearance"; and others said it was not so—that it was vice versa. And that dispute was and is named the problem of the One and the Many.

c. We shall see in detail that the problem is by no means an academic one, without appreciable effect on actual life (see Index, s. v. "One and Many"). For identically the same problem is involved in the theological Trinity, and disputes over that plunged peoples into wars for centuries and still produce clashing, expensive sects. Whether a democracy is right, or an autocracy or other sort of aristocracy, is the same problem (XIX). As the problem has not before been rigorously and with explicit consistency settled, it fundamentally produced the world war, which was an attempt, perhaps more automatic or instinctive than conscious, to find out how much aristocracy could be imposed on people.

d. We have already implicitly seen in our concrete example $2+3=5$, that the problem of the One (the whole) and Many (parts) was not an actual problem at all, but simply a puzzle of form—of arbitrary use of language, of verbal technique. Man invented a language; and he thereby created a verbal puzzle which he fancied was a real, world-shaking problem. And he finally got so befuddled that he called it the riddle of the universe—or if theologically inclined, the mystery of God. The human race took words, mere words, far too seriously—made idols of them. The race have been highbrows:- idolaters of words, the last species of a long line of idolaters of more tangible things. However, we shall see that the normal man actually did not get so befuddled: he merely made no explicit reply to the numerous varieties of aristocratic exploiters who kept misusing language according to their own mistaken ideas of self-interest until they came to believe their mendacities and evasions. That befuddling, highbrow bunco game is now mild in comparison with the past. But it may be observed still—nearly surely in this morning's paper, unless like the Boston "Transcript" it has an editor especially well ballasted with fair-play commonsense. This book explicitly shows how the priesthood of that last, most subtle idolatry work their game.

e. The sum of the matter is that there exists no riddle of the universe, no mystery—that there exists no *real* problem of any sort. The solution we shall get to that pseudo-problem, which we have already seen broadly given by everyday observation or commonsense in §12, is that the One is true, and that the Many is also true in a formal way, even though they are formally contradictory. We shall simply investigate those formal contradictions, and see how to keep out of any real contradictions, and how to eliminate our various verbal puzzles.

§15. a. We may go somewhat more into detail as to the modern forms of the One and Many.

b. John Dewey, in the "Introduction" of his "Essays in Experimental Logic," definitely implies continually that this One and Many underlies all philosophy or logic. Dewey is accepted by the experts as a leading authority (see Riley, "American Thought"; "Ency. Brit.," xvi, 918, footnote 6). I think he is one of the best of all philosophers, logicians, and psychologists—and I may add that since he wrote the Introduction for me I naturally think so more emphatically. And William James, who was finally in his "Radical Empiricism" almost as sound as Dewey, says somewhere that he has come to believe that the One and the Many finally underlies all problems.

c. Russell, one of the leading mathematical authorities, shows in a general way ("Ency. Brit.," xvii, 881) that the One and Many is at the base of mathematics, and points out the contradiction—which he says he obviates. We have seen (§3c) how the mathematician Shaw disagrees that Russell avoids the contradiction, and states that Poincare was doubtful of ever reconciling mathematical differences of opinion over infinity (*infinity* is one mathematical name for the One—see §§30, 43).

d. Technical scientists rarely use the "philosophical" name, "One and Many." But we may quickly find them asserting the existence of the "problem" in the most orthodox of treatises. E. g., Maxwell is quoted in Watson's "Physics" (p. 2):- "The difference between one event and another does not depend upon the mere differences of the times or places at which they occur, but only in the differences in the nature, configuration, or motion of the bodies concerned." In that statement Maxwell is obviously trying to say what really divides the whole or One of things into parts or "events" of the Many (and as he didn't know, his statement is, as we shall see in time, confused and unintelligible—although it is given children to learn). And three times he uses a form of the term "*difference*," which is itself a technical philosophical term—the problem of Differences—that is substantially a synonym of "One and Many."

e. That shows with great brevity that authorities agree that the One and Many is fundamental, even though they name it variously. As we proceed we shall incidentally see all kinds of authorities naming the problem, and puzzling over it. The general statement of the problem obviously is:- we *seem* to see the universe in two opposite aspects, (1) split into parts as the Many, and (2) connected into a whole as the One, or universe: and the problem is, *How reconcile that apparent contradiction?*. —— We are now ready to see, by our own observation and without any of the explicit support of convention and authority which I have been citing above, that the problem is fundamental, even though we state it in everyday "scientific" terms:-

f. First, we consider broadly the very bottom thing of science, a "machine" (for details, see §§21, 86f, 96g). When we say a machine works—and obviously it is not a machine in a conventional sense if it does not work,—we consider the machine as a unit—as a One. Equally obviously, the machine is made up of parts, which are the Many. Everything which we conventionally call a machine has at least two perceptible parts:- e. g., a lever is the bar (or "lever") *and* the fulcrum; a screw is the thread (the "screw") *and* the nut; the inclined plane, as a machine, is the plane *and* the load on it. In each case there is a *frictional union* of *parts* which may be "separated." We may make a typical sentence for, as, or "describing" a machine:- *One part plus* [*i. e., held on by some degree of friction to*] *at least one more part is a machine.* Or, we may abbreviate:- *One part + One or more parts = The machine, or the Whole.* Or, *The Many = The One.* —— There, in a "scientific" "machine," we obviously have parts equal to a connected whole—which is *formally* contradictory. But obviously, *both* are true (so far, we see by ordinary commonsense that they are true; later it is *explicitly* proved to be true—IV). So again we have our general "solution":- *The Many=The One.* And we see at once that the mistake some people have been making as to "machines" was that they emphasized the *parts* of the machine, and overlooked the equally true fact that there was a machine only as it was

a connected, consistent, really inseparable whole—related together as a structure, or organism (XI). When a baby takes apart a watch it is no longer to him a watch—it is not a watch except as it works together. When an infant philosopher or scientist or theologian takes apart the universe—"analyzes" it, not into a "machine," but into machine *parts*, —he can not put it together, and to him it no longer is the universe or a whole; to him it is a pile of mental junk, variously named agnosticism, dualism, etc. But, the obvious fact is, he never did actually take the universe apart; in his egocentric, anthropocentric way (§§40f, 73h, 100, etc.) he just fancied he did. The universe kept right on working, and his "analyses" produced no real problem.

g. Newton's first law of motion, which asserts inertia, explicitly states that no body can move unless acted upon by another body (§88). If we agree to *say* that bodies move (we *could* construct a valid science, wherein nothing verbally moves—§97), then at once we imply that in some way the universe (the One) is as a whole made up of parts (the Many) which are *connected* in some way that permits motion (by orthodox logic no such motion can occur—Index, s. v. "Zeno"). And as we shall see (§88), the other two laws of motion were Newton's attempt to assert that there was no logical contradiction in that assertion of inertia. In short, his laws were an attempt, surprisingly successful for that age, to solve the One and the Many.

h. The last two paragraphs give two of the thousands of ways in which science names its forms of that so-called philosophical problem of the One and Many. I may at this point merely name some other ways that will probably be seen obviously to involve the problem.

i. There is now much apparent conflict between "quantum" theories, and "continuous" energy theories—such as wave theories. Those quantum theories in effect assert that fundamentally the universe is divided into parts (here, parts of energy—the term *energy* being the more usual scientific name for *universe*). The opposing theories assert that there is no such division—that the universe in continuous (XIII).

j. That conflict of words begins far back in scientific history, and comes up to the present day. Is heat small, Many motions (and if so, a Many of what?); or is it continuous phlogiston? Is electricity continuous energy (the One), or discrete as electrons or corpuscles? Usually now it is taken as discrete; but the question has already come up whether electrons are continuous inside. Is light continuous as waves, or discrete corpuscles—or in modern terms, discrete magnetic disturbances? Or, in more generality, are there *exact* or eternal or absolutely separate atoms (the Many); or no exact, really separable atoms (the One)? The so-called kinetic theory gives two answers to that which contradict each other (§89, etc.). And the electron theory is in the same contradictory condition:- Thomson and his school hold that electrons have tubes of force, which substantially amounts to continuity; and the other school have discrete electrons in what is substantially the older kinetic theory.

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§16. a. I think that is enough evidence of the general need of an investigation of the One and Many. It is probably already obvious to the reader that the investigation, even if it does apply only to a verbal confusion, is of fundamental importance in reaching a conscious understanding of things, regardless of whether we consider those things as belonging to science, philosophy, or religion. So we begin the completely explicit solution.

§17. a. "The Encyclopaedia Brittanica" (11th edition) seems to me to be the most reliable generally available authority as to what are orthodox doctrines concerning most subjects. As I am trying to use words in their customary senses, so as to be easily intelligible, I shall frequently cite that encyclopedia as giving such general agreements as to words and facts. Hence, in developing the meaning of "One and Many" I shall show some of the details of the orthodox difficulties by quoting the important parts of that encyclopedia's articles on pluralism and monism:-

b. Art. "Pluralism":- "Pluralism ***, a term used *** in philosophy for any theory which postulates more than one absolutely distinct being or principle of being [postulates the Many], opposed to monism. Pluralistic systems are based on the difficulty of reconciling with the monistic principle the principles of variety [or Difference] and freewill. The chief difficulty which besets any such view [that there is an absolute Many, or pluralism] is that if the elements are absolutely independent, the cosmos [universe] disappears and we are left with chaos: if, on the other hand, there is an interrelation ***, the elements [the Many] are not ultimate in any intelligible sense." —— I. e., if the universe is not chaos, then as a truism it is not possible to say (as a concrete example), that there is any actual difference which will permit us to distinguish between a man and a moon. Clearly, if we take language forms as seriously as the writer of that article, we are fundamentally forever barred from knowing anything.

c. Art. "Monism":- "Monism, *** the philosophic view of the world which holds that there is but one form of reality, whether that be material or spiritual. The aim of knowledge is explanation, and the dualism or pluralism which acquiesces in recognizing two or more wholly disparate forms of reality has in so far renounced explanation (see Dualism [i. e., the Article quoted in the last paragraph]). To this extent monism is justified [probably the writer means that monism is justified in that it 'explains']; but it becomes mischievous if it prompts us to ignore the important differences in facts as they present themselves to our intelligence. All forms of monism from Plotinus downwards tend to ignore personal individuality and volition, and merge all finite existence in the featureless unity of the Absolute; this, indeed, is what inspires the passion of protest against monism. Turning to the historical forms of the theory *** [there follows a short statement of philosophical technicalities not needed here; and it may be added that there seems to be evidence of Chinese monists centuries before Plotinus]. Those who maintain that all these forms are hasty and superficial stand by the conviction that the right philosophical attitude is to accept provisionally the main distinctions [differences] of commonsense [but we saw, in the case of the machine, §15f, that commonsense gave also a One, as well as that Many], above all the distinction of personal and impersonal; but to press forward to the underlying unity so far as experience and reflection justify."

d. We may note that the writer of the second article speaks of "a passion of protest." In short, the reason people have not agreed on the One and the Many is, from one point of view, because they took mere words so seriously as to become violently emotional over the problem. There is current an odd fiction that philosophers are unemotional (for the psychology or "human nature" of it, see §155); but we have just seen the staid "Brittanica" tacitly agreeing that it is proper for emotions to keep professional philosophers from agreeing. It is sometimes fancied that scientists do not thus let emotions interfere with *their* consideration of the actual facts. But some in real life become violently emotional the minute this problem is mentioned; e. g., one professional astronomer spat out "metaphysician" at me, as the vilest epithet he could invent, because I incautiously used with him

the name "One and Many." —— Those remarks are made to show that there is all the emotion there is, concealed under the apparently harmless and abstract "philosophical" problem of the One and Many. We are going to go cautiously with it, so as not to set off any premature emotional explosions. (See Dewey's recognition in his 8th paragraph of one of my methods of doing that which I agree I have overdone, but which I don't dare modify.) But when we have the solution thoroughly controlled, it is to be shown that a real grasp of the problem is an ultimate religious experience, or "conversion," or "rebirth" (§§153f, 162).

§18. a. The *One* is therefore a conventional and useful technical term meaning that the universe with all its phenomena is inherently continuous or joined together; or is an absolutely inseparable or indivisible unit. We shall see the proof that the universe is really thus; but at the same time we shall see that it is absolutely impossible to make a *positively* intelligible statement or expression about such a universe. Consequently, to anticipate—perhaps somewhat unintelligibly here,—the universe will arbitrarily be talked of as a pluralism—explicitly as an *'infinite pluralism,'* which is a formally self-contradictory name, not before used in that sense so far as I know.

b. The *Many*, as a *conventional* technical term, means that the universe is made up of more than one part, each part being absolutely distinct, separable, and absolutely real in itself; "the Many" is the conventional name for the parts. Obviously, such a 'collective' name is *essentially* self-contradictory if it is supposed to have a real meaning, if the parts are absolutely separate; for in that case they are truistically absolutely *not* collectible, even verbally. Hence, in this book we shall not have "the Many" used with that absolute conventional meaning. I shall use it as a term, admittedly *formally* self-contradictory and desirably so, which asserts or implies that we have *arbitrarily* divided the universe into parts, basing the division upon certain agreements among men (§100, etc.). For, to anticipate the proof again—and again perhaps somewhat unintelligibly here,—when we are *positively* intelligible in our language, we have to speak concretely of the Many; an actual language is otherwise impossible (IV). Also, we may validly hold that the *infinite* Many is true, or is the One (§49).

§19. a. The only other technical philosophical word which the reader need remember is *dualism*. Instead of using the now unfashionable theological name *devil*, I say *dualist*—and there are many professed dualists, although as a matter of fact there can not possibly be a real dualist, as we shall see. Kant, in so far as he was explicit, was a dualist; the Germans took him seriously—and see what happened to them.

b. By *dualism* I mean that nonsense which is dressed up in the orthodox "logical" form—i. e., all explicit, formal orthodox "reasoning" is dualistic and nonsensical. I shall describe that conventional form by this quotation in substance from Art. "Dualism," "Ency. Brit.":- *Dualism* is a term that is applied to all doctrines which try to explain facts by classifying them all under two coexistent and separate or distinct forms or "beings." Dualism in technical philosophy postulates—i.e., *assumes* and then undertakes to prove—the eternal coexistence of positively separate mind and matter; it is thus opposed to an "idealistic monism" and a "materialistic monism." [The "Encyclopaedia" says there are those two sorts of monism, thus obviously making "monism" also *finally* dualistic; as a fact, the German variety of "monism" does in effect make so-called monism a dualism—§49.] Similarly, there are two forms [a "dualism"] of dualism. One form is that mind and matter are absolutely heterogeneous [that is the form that has been substantially stated just above]. The other holds that matter in its usual sense does not exist, but that we have an "idea of matter," and the dualism then consists of the eternal absolute distinction between (1) the idea of matter, and (2) ideas themselves, or "reason." —— The reader need not worry if he fails to understand all that: it is unintelligible *when considered explicitly*. I have been simply quoting—translating into my crude, common words. Indirectly and implicitly, that formal dualism contains the basis of truth, so that it will vaguely mean something:- for we saw that dualism at once formed a dualism of dualism: that regress actually implicitly goes on indefinitely and gives the truth (§§23-4). But that remark is not intelligible at this point.

c. In the Article "Dualism" there are given numerous historical facts about the forms of dualism. E. g., according to the encyclopedia the "Christianity" which holds that there is a God and a Devil is substantially dualistic, and the morality that makes Good and Evil absolutely distinct is positively so. In suitable places below I shall solve those puzzles without burdening the reader with the explicit historical details. But I may mention here, in anticipation of the proof in §24c, that *all orthodox* pluralism is in final form dualistic, because orthodox logic is explicitly dualistic. In short, *all* positive expression in past history, previous to the present solution of the verbal trick, was *technically* a pluralism which was a dualism, and hence was technically wrong, if we hold it rigorously to a valid logical standard. As a matter of fact, very few people ever dreamed of interpreting previous expression thus rigorously: *substantially*, most past expression was right, and sensible people actually definitely disparaged the orthodox logic, and very great men like Christ practically repudiated it (§162e).

§20. a. We see thus that orthodox philosophical terms are quite self-contradictory. Orthodox scientific terms are as bad, as we saw in §15, and shall see in more detail from time to time. Those contradictions are obviously the attempts of various men to *dodge* the formal contradiction that is *un*dodgably inherent in the One and Many. So inevitably, those attempts to escape the inescapable simply, for each attempt, put the contradiction in a new place; and instead of resulting in a "solution" where no solution was needed, simply added one more verbal puzzle. (That is the whole qualitative history of "philosophy.") The attempt became more puzzling when the contradiction was made *movable* within a given "system," so that it wasn't "there" just when we thought we "had" it:- such an elusive state of affairs occurs in technical philosophical *mysticism* (analogous words are *mystify* and *mysterious*), or in Bergson's "intuition"; or in modern science, relativity is really an example, which by rigorously making the contradiction move infinitely becomes technically sound, as will become intelligible in §66.

b. We may here, in further detailed proof of the existence of such contradictions, *and as a useful means of becoming inoculated against taking any "isms"—"systems"—too seriously*, casually note some further substantial quotations from the "Encyclopaedia." I use the Articles "Realism," "Idealism," "Mysticism" (and of course what I thus substantially quote is, just of itself, mostly unintelligible—a deliberate but factually correct parody on the human mind as it disports itself in the "higher learning"):-

c. *Realism* is a "philosophical term used in two opposite senses. (1) The oldest of these is the scholastic doctrine, traceable back to Socrates, that universals have a more 'real' existence than things." A "universal" of a chair (say) is not real chairs, but the mental "ideal" chair. In its extreme form of this first meaning, realism denies the reality of

anything but "universals," and is opposed to what is called "nominalism" and "conceptualism." [That denial is of course logical nonsense; a "universal" is what we later call a relationship word—see §§57, 49 for the solution of that orthodox nonsense.] (2) The modern application of *realism* is to the opposite doctrine that there is a reality apart from such universals. There are several forms of that sort of doctrine:- e. g., "natural or naive," "ideal," empirical," "transcendental," etc. —— [Obviously from those quotations, the two opposite varieties of realism are tacitly both dualisms. But when expression is so vague and conflicting as those quoted definitions, no one can say positively what such expression does mean.]

d. *Mysticism* requires about five of the encyclopedia pages, the size of these, to explicate. The article says, to begin with, that mysticism is a "phase of thought, or rather perhaps of feeling, which from its very nature is hardly susceptible of exact definition"—[as a matter of fact, we have no difficulty in this book in considering it under the name of infinite regress, which in psychology is called by the very common names emotions or feelings—see Index, "Infinite regress," "Emotions"]. "Most frequently it [mysticism] appears historically *** as a reaction of the spirit against the the letter." In short, orthodox historical mysticism makes an inconsolable contradiction between "spirit" and "letter" —and having no "letter" can not actually express itself. The emotions of mystics are "violent"; they are said to have "fervid Godward aspirations." —— [I may mention that several notable mystics have been considered by some to be on the border-line of insanity, if not over. Women sufficiently hysterical to be on the verge of insanity, such as St. Theresa, are often mystics in the orthodox sense.]

e. The "Encyclopaedia" uses six pages to explicate *idealism*. First, there are two rather opposed meanings:- (1) The popular meaning is substantially:- "abstract perfection"; i. e., "ideals." In that sense, idealism is a form of monism. As commonly used by the average man, I do not think that *idealism* is quite so exaggerated, but think that it is merely his name for the valid logic we are to deduce explicitly (cf. §49, etc.). (2) The technical meaning of *idealism* is:- the doctrine that conceives knowledge or experience as a process in which two factors, subject and object, stand in entire independence of each other. That of course is admittedly dualism. It is distinguished from so-called "commonsense dualism," which regards mind and matter as being in "more or less accidental relation" with each other, in that it "seeks to realize its own ideas"—[by which hysterical phrase I suppose is meant that it strives to relate its ideas into a One, and thus stultify itself, and flop over to the opposite first meaning]. —— The article states substantially that there is no contradiction between technical, dualistic idealism and James's pragmatism. But as a fact that is easily verifiable, James, in "Essays in Radical Empiricism," did *explicitly* flop from dualism to a monism that was really valid logic (§§49p, 156).

§21. a. Viewing that maze of nearly unintelligible conventional contradictions, the reader has probably seen for himself that orthodox philosophy is rather indeterminate. It was fairly obvious that the contradiction, which was shifted about from point to point by the various "ists" in their different "isms," is the formal one between the One and the Many. —— Of course I took the easy way and made a parody—a slight exaggeration—of that "higher thought." (Those past experimental efforts to get consistent thought were of course needed, and have actually been my guide in working out this book.) But a proper *constructive* summary of the whole thought of the race is given by Dewey in his Introduction. His summary is a masterpiece, and was far beyond my powers—in fact, the reader needs to know considerable about the history of thinking to be able to appreciate the excellence of that summary.

b. And probably the reader has seen already, in anticipation of the explicit discussion in the next chapter, that the whole aim of philosophy and religion, in the search of a *consistent* way of stating truth, was to get 'one part' related to, or joined in some way with, 'at least one other part,' in order to have the united, or One, meaning. In fact, as was indicated in considering mysticism (§20d), unless there are at least two such *verbally* contrasted parts, there can be no *positively* intelligible expression. So philosophy was always thrown back upon a dualism; and just as inevitably, as we saw under "idealism" (§20e), it then struggled from that really merely verbal dualism—which however it took too seriously, as being "real"—back to a united or One meaning. And obviously, *dualism* is nothing more than an equivalent name for "machine" (§§15f, 86f), or for "analysis." Scientists use "machines" and "analyses," and most of them, precisely as do philosophers, struggle to get away from that dualism to a popular idealism, or an intelligible "relativity," or a "unification," or "understanding"—or really, to an *explicit* religion. Those who are too weak to struggle much tend first to be "quitters" by asserting agnosticism; when they are sufficiently calloused to that lack of unification or understanding, they become materialistic—which variety of hardened, indifferent ignorance is, in everyday terms, named *cynicism*—the dogmatic ignorance of the quitter that is temporarily forgivable in the young, who almost invariably assume it for a while as a protection from becoming too fatigued by the flood of impressions rolling in (§155).

c. It is possible to go on from this point and show that philosophers, poets, and prophets have invented an idea they called God to make that dualism or machine work. When they asserted (as the result of short vision—cf. §47) that there really was a distinct dualism, then they obviously had to have something to make that apparantly totally disassembled machine get its parts together, and work together, in order that it be intelligible or do what we plainly see it doing. And they used their "God" to do that. Obviously, if God actually stuck the pieces together, then as a truism, there was *not* any longer a dualism, or dismantled scientific machine. And, unless the prophet himself actually created that God, then clearly the God existed previously, and there was *not* the dualism the prophet or scientist began by asserting existed. So we see, merely as a truism, that the idealist-dualists who 'seek to realize their own ideas,' and the realist-dualists who make their machine work somehow, both have, like the mystics, "fervid Godward aspirations" —which means, in commonsense terms, a desire to see things as they are (§§153f, 162, 166).

d. But we shall not spend any more time directly upon such vague orthodox philosophy or theology, even in order to see the interesting historical facts concerning man's intellectual inventions of God in his (man's) own image (§170jm). We shall proceed to make first-hand, rigorous investigations of facts for ourselves, and not rely upon picking out consistencies from the maze of conflicting "authoritative" doctrine —although the reader may readily do that for himself, if he likes. By having heard those authorities a little we have found some useful conventional words; and the reader is perhaps convinced that it won't do to take some of such authoritative "knowledge" very seriously.
