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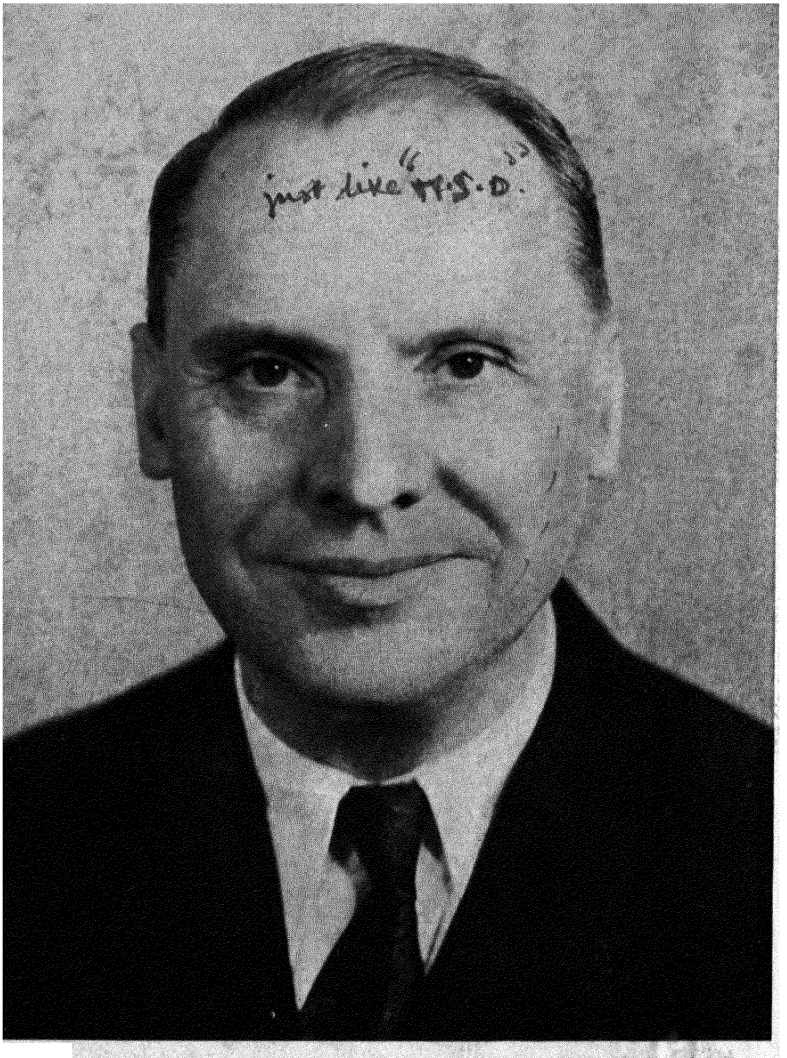
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GOD

A COSMIC PHILOSOPHY OF RELIGION



"John Elof Boodin"

GOD AND CREATION

GOD

A COSMIC PHILOSOPHY OF RELIGION

JOHN ELOF BOODIN

PROFESSOR OF PHILOSOPHY

UNIVERSITY OF CALIFORNIA AT LOS ANGELES

NEW YORK

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1934

To an Inspiring and Constructive Leader
in
Liberal Religious Thought

DOCTOR L. P. JACKS

FOREWORD

This volume gives the author's constructive effort to furnish an idealistic world-view in line with the progress of history and science. It centers in the idea of God and his relation to nature and to man. It is intended for honest thinking people who are trying to find their way in a confused world. The interpretation of the universe in this book is undertaken in natural piety, in the spirit of science. But the author believes that it is consistent with the fundamental intuitions of Christianity, if not with its traditional theology. He believes that a reconstruction is called for by the intellectual and social epoch in which we live, but tradition offers powerful inertia even after it has lost its vitality. The Catholic Church has its own official theology. If it must have an official theologian of the mediaeval tradition, it could not have chosen a better one than St. Thomas Aquinas. He vitalized the tradition of his day by fresh contact with Greek thought and, with great genius and pious regard for the truth, summed up the past into a great synthesis; but, like every great thinker, he was part of his age and was limited by the beliefs and outlook of his age. The author feels that there is need of a fresh interpretation in the intellectual climate in which we live. In attempting such re-interpretation the author has found the Platonic tradition in which early Christianity took form especially congenial.

Protestantism stands very much in need of a theology. The fact is that Protestantism has never had a theology of its own. If it substituted the authority of the Bible for the Church at the time of the Reformation, it yet interpreted the Bible in terms of the Catholic tradition. But now it is in a process of dissolution theologically; and in the transition it is subject to various "winds of doctrine." In its confusion it sometimes grasps at materialism, sugar-coated as emergence, sometimes

falls back on a vague cosmic emotion, sometimes satisfies itself with a general humanitarianism, leaving God at most the rôle of Santa Claus. It is alert for any endorsement of religion by eminent men of science or philosophy, as though religion needed endorsement. It is at best a crazy quilt of new patches on an old garment. If Protestantism is to be saved from complete disintegration, it must be through a vital idealism which furnishes the inspiration for a new kingdom of man. It cannot save itself, for long at any rate, by attempting to rival the theatre or the circus. To those that are honestly seeking a theology in our modern world, the author offers this book as a suggestion.

The essays of this book, with the exception of the introductory essay, are printed in the order in which they developed in the author's mind, though, since they have been revised from time to time, they have consistency of thought. They may be treated as Platonic dialogues, each with a unity of its own, but having altogether, the author hopes, a cumulative effect. This has the advantage that the reader can choose as his mood guides him. The essay, "Matter, Space and God," was read in part to the Pacific Division of the American Philosophical Association in 1931. The last two essays were read respectively at Symposia on Philosophy and Music, at the Philosophical Union of the University of California at Los Angeles, 1931, 1932, to show that philosophy and music may express, each in its own medium, the same great themes of human life. It was not possible to have a great master of music translate the thought of these essays into his own language. It was, therefore, necessary to use compositions of great masters in the past who have interpreted the same themes. The author was able to convince many of his students and some of his colleagues (notably the physicists) that, in a broad sense, such correspondence of effect exists. However that may be, the essays are a fitting close to this book.

God and Creation is a sequel to *A Realistic Universe* (Macmillan, 1916, revised 1931) and *Cosmic Evolution* (Macmillan, 1925). The volume, *Three Interpretations of the Universe* takes up three conceptions of the universe: Preformation, Emergence and Creation, in terms of their leading exponents in the history of philosophy and science, and aims to furnish a background for the picture of the universe which is presented in this volume. While this volume has a unity and completeness of its own, the author hopes that those who find it stimulating and helpful may be led to examine the author's survey, in the companion volume, of the contributions by great minds through the ages to the interpretation of the universe. One cannot live with the immortals without receiving fresh inspiration for our present needs.

The author wishes to express his obligation to the *Hibbert Journal* for the use of the articles, "God" (July, 1929), "The Universe as a Living Whole" (July, 1930), "Divine Laughter" (July, 1934), and to *Philosophy* for the use of the article, "Cosmic Interaction" (November, 1931), afterwards reprinted in *Contemporary American Idealism* (Macmillan, 1932) under the title, "God and Cosmic Structure," which is the title used in this book. These articles have been revised and enlarged for this volume. Part of the essay, "A Dualistic Cosmology," was read before the Seventh International Congress of Philosophy at Oxford, 1930, under the title, "An Animistic Cosmology," and published in the *Proceedings*. Finally the author wishes to express his profound gratitude to those who have followed him with sympathy and have encouraged him to make this new effort at interpretation, especially to his friends: Mr. Norman Hinton for making the Index, Professor J. A. Leighton and Mr. Alfred Allen for reading the manuscript, Mr. O. J. Mitchell for reading proof and Dean C. H. Rieber for his appreciative interest in the writing of this book.

September 14, 1934.

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Chapter 1

THE CRISIS

"In God is no unrighteousness at all—he is altogether righteous; and he of us who is the most righteous is most like him. . . . To know this is true wisdom and manhood, and the ignorance of this is too plainly folly and vice." So wrote Plato in the *Theaetetus*.[1] We are told by Burnet that "Plato brought the idea of God into philosophy for the first time."[2] It was Plato who discovered mind as a spiritual principle, distinct from matter, and it was Plato who contributed the idea of God as spirit to Western thought. He is the first Western theologian in the strict sense; and in the profundity of his intuition he is the greatest. It was, however, Plato's pupil, Aristotle, who coined the word theology[3] for the new theocentric cosmology which he shared with Plato, although with an interpretation of his own. "There are, 'says Aristotle,' three theoretical sciences—physics, mathematics, theology. The class of theoretical sciences is the best, and of these themselves the last named is best; for it deals with the highest of existing things, and each science is called better or worse in virtue of its proper object."[4] It must be remembered that for Aristotle theology is a science in the same sense as physics. It must be based upon the same logic. But it is a superscience. Were physics sufficient to explain the facts of experience, Aristotle tells us, there would be no need of theology. Plato and Aristotle were convinced, as was Newton later, that we cannot understand the universe without God. For Plato the new idealism was more than a logical conviction. It was a passionate religion with which he hoped to save Greece from its moral and political chaos by creating a new Republic, a picture of a just and happy humanity. He found by sad experience that such an ideal state could not come

at once and he, therefore, later (in the *Laws*) advocated as a compromise "a second best." But a new inspiration, which has reverberated through the ages, had come into Western thought.

It has been said that history moves in cycles. Our perspective of human history is too limited to make a generalization, but if we consider Western historic civilization alone, the appearances favor the hypothesis, though repetition in a new epoch must necessarily be repetition with variation. Western culture has moved round to an epoch which is strikingly analogous to the social and spiritual crisis which existed in the Greek world towards the end of the fifth century, B.C., when Aristophanes wrote: "Zeus is dethroned. Chance is God." Materialistic naturalism, aided by sceptical humanism and the disillusionment of a tragic war, had routed, for thinking people, the old mythological gods. Socrates clung in piety to the old religion, while he tried to discover a new basis for morals in the common reason of man and so created the science of utilitarian ethics. But Plato saw that ethics was not sufficient, and devoted his genius to show in matchless dialectical dramas that the human ideal of a good life is a presentiment of a cosmic order in which the Good is the ultimate creator, legislator and encourager of ideal values. For Plato the moral struggle of producing order in the world of conflicting human impulses is a part of a cosmic creative process to produce order in chaos. Our ideal urge for form and measure is an intimation of form and measure in the universe; and these imply a mind which works in the universe for form and measure. Ethics becomes part of theology. Science is communion with God.

In projecting form and measure into the universe, Plato was aided, no doubt, by the mathematical tradition of the Pythagoreans and still more by the brilliant mathematical discoveries in the Academy. Astronomers were applying mathematical models to the heavens, and Plato

shows in the *Timaeus* that a new mathematical physics was being born which indicated the control of the physical world by geometry. Mathematical idealism and ethical idealism grow from one root—the faith that the universe is ruled by mind. Whether mathematical idealism suggested ethical idealism to Plato, or vice versa, we shall never know. It is enough that they were one for Plato and that ethical idealism held the primacy, because it furnished the *raison d'être* which makes mathematics, or anything else, worth while. Through Plato's brilliant satire and Aristotle's scientific analysis, Chance—materialistic naturalism—was put to flight. So decisive was the negative victory that Greek mechanistic philosophy, in spite of the literary genius of Democritus, survives in only a few sentences, and was only saved by Lucretius' great poem, which however played little part in Western civilization until the modern Renaissance.

The positive victory of Plato's theology, however, was not so immediate. He did not succeed in vitalizing Greek religion to any large extent in the generations following. Aristotle's God was primarily a scientific and aesthetic hypothesis. He did not satisfy the religious needs of man. The Stoics fused the idealism of Plato and Aristotle with the naturalism of Heraclitus; and while they did much to broaden the concept of human law and brotherhood, there was always danger of their naturalistic pantheism weakening to "a polite atheism," as has generally been the tendency with pantheistic idealism. In Alexandria, Platonism blossomed out into new life, but it became fused with oriental mysticism. And while Platonism furnished the foundations of the theology of Christianity, it was rapidly transformed in the climate of Roman civilization. Under Roman influence, power was apotheosized, instead of the good, as in Plato and the prophets of Israel. Theology in the Middle Ages, instead of being a magnificent induction from human experience, the acme of scientific thought, became an *a priori* sci-

ence, founded on assumptions which were hallowed and reinforced by the authority of the church. Theology was divorced from the empirical sciences, which were accordingly despised and neglected.

The Renaissance marks the beginning of the revolt against authoritarian religion which would subordinate reason to faith. Chance returned with Lucretius; and the mechanistic view of the world, though suspect at first, found entrance under the garb of the new science. The great pioneers of modern science were devout men, who subordinated their science to their religion. The great Newton introduced his theology as a *scholium* in the second edition of the *Principia*. But his great science of mechanics went its way victoriously, irrespective of the *scholium* and gave rise to a corresponding world-view. Science and authoritarian theology have lived together in the modern era, but they have not been integrated. In method the two are irreconcilable. They have generally existed in different compartments in men's minds, satisfying different needs; but the incompatibility between them has periodically flamed into warfare, when the traditional beliefs of religion have been shocked by new scientific interpretations. So far as science itself is concerned, the mechanistic view has been, until recently, triumphant. And there has been a growing feeling among intellectual people that religion is a diminishing domain, which will eventually disappear with the light of scientific truth. The climax of the Renaissance came at the end of the nineteenth century. Materialism proclaimed in the name of science: "Zeus is dethroned. Chance is God." In its new disguise of emergent evolution, materialism has become more insidious. It seems to incorporate everything in the way of facts and values. Everything emerges, even deity. But how shall we account for the progressive evolution of structure? Is structure merely a matter of chance? The real problem of evolution is the problem of organization. We must account for emergence.

We are faced today with a situation analogous to that at the end of the fifth century B.C., but on a vastly larger scale. Materialistic naturalism has sapped the foundations of the old theology. There is a general confusion about moral standards. A cataclysmic war has produced disillusionment among vast masses of human beings. The technical progress of science has antiquated our old economic system. A new order of things is called for, in the social and in the spiritual realm alike. Because institutional religion has allied itself with the past, there has been a growing revolt against it on the part of the struggling masses; and Russia has officially adopted a materialistic philosophy. But this is giving the human spirit a stone when it asks for bread. The fault is not with the religious feeling of man but with the forms of theological interpretation. The religious feeling is ineradicable and will create for itself new symbols under any philosophy.

* * *

We need a new interpretation of religion which shall ally it with the upward striving of man and reinforce what is best in human nature. As in the fourth century, B.C., materialistic naturalism must be routed by an idealism which shows man his true vocation in society and in the cosmos. A pantheistic idealism which teaches that all is right with the world and that the temporal struggle for ideals is merely a finite illusion will not do. Bradley had at least the wit to see that the absolute can not serve as an object of religious worship. We need a conception of God which shall give meaning to this pluralistic, temporal world and which shall also furnish the inspiration to create a better world. A religion, to be worth while, must call men to fight against the injustice of the world as it is and to work for such opportunity for every man as he can use in happy community with his fellowmen. We need a new Plato with philosophy and vital faith,

with poetry and logic, with a vision of a just state and a conception of God which inspires man to work and to sacrifice for the highest ideals. If we can not at once, considering the ignorance and prejudices of human beings, achieve the ideal best, we can work for the second best until the best becomes possible.

There are encouraging symptoms at the present time. Under the pressure of present misery, men are obliged to think about a new social order as never before. There are signs, too, that the old materialism, which fortified itself behind a mechanistic science, is finding its bulwark crumbling. As in the fourth century B.C., the breach has been made by a new mathematical outlook upon the universe. The new physics has discarded the old mechanical model; and, with far greater success than was possible in Plato's day, is discovering measure and number in the universe everywhere. This new insight is leading some physicists today, as it led Plato, to enthrone mind as the orderer of the universe, though we must with Plato recognize that there is much chance and wildness in the universe, in the large as in the small, which has not yet been persuaded to obey ideal patterns. It is significant that the most popular preachers of idealism today are not the philosophers, but the physicists. But it is important that the transition to an idealistic philosophy shall be well-reasoned and not be the short cut of sentimentalism.

I am convinced that the time is ripe for an idealistic revival, for an idealism which shall give men hope and courage in their upward struggle. It must be an idealism which is grounded in the facts of human experience. Plato modestly said in the *Timaeus* that if his cosmology was as probable as any other, his friends should find no fault. But Plato believed, and we are now in a position to testify, that the idealistic interpretation is vastly more probable than any other. It is true that we can not hope for rigorous proof of an interpretation of the universe, but we must take account of the indications from the evidence

that is available. And we must keep in mind that the scientific interest is not the only interest of man. A theory of reality must give due place to our aesthetic and religious interests as well as to the scientific. Even if the idealistic interpretation were only as probable as the materialistic, so far as science is concerned, yet if idealism takes care of the other vital interests of man, and materialism fails to do so, idealism must be preferred; and I try to show that it gives a more adequate interpretation of science itself than does materialism. Philosophy, moreover, need not just wait upon science. It can, as Plato and Aristotle showed, be an effective critic of science and the prophet of a new and better science.

I realize that idealism is a vague word and has come to include a variety of philosophical systems with a wide range of differences. There is great need of a more precise definition of idealism, in the spirit of Plato, the founder of idealism. In modern philosophy idealism has, for the most part, meant mentalism, which holds that nothing is real except mind and what mind creates. This conception of reality has generally been coupled with a subjective theory of knowledge, viz. that whatever is real must exist for mind and be known by mind. Because everything must be known through experience, it has been assumed that everything must be experience. Experience has been converted into a substantive, instead of being recognized as a relation, which it really is. We can have experience of various things—stones and trees and human beings. Whether they must be recognized as minds must be determined by their behavior. It must ever be the office of philosophy, as Plato recognized, "to save the appearances"—material appearances as well as mental appearances—and to give to each type of appearance its due rôle in a whole-view of reality. To conceive everything as mental stuff is as indiscriminating as to conceive everything as material stuff. It is merely changing the rubric. The important thing is not the stuff but the grades

of value. In this, I take it, the great systems of idealism, ancient and modern, agree.

The great advantage of Platonic idealism is that it really saves the appearances. This neither mentalism nor materialism can do. Mentalism and materialism divide the world between them, with quantity overwhelmingly in favor of the materialist. Neither can account for the other one's world. They are historically compensatory movements. Eighteenth century materialism had enthroned matter as the ultimate reality and made mind a mere function of matter. The romantic idealism of the nineteenth century transformed everything into mind and made matter, space and time mere appearances. Platonic idealism overlaps. It gives a reasonable place to both the material and the mental facts. In magnifying mind, it does not deny the reality of matter. It is the only type of idealism which can supplant naturalism by absorbing it.

The great human appeal of idealism has been a call to recreate the world into a better world, with the assurance that a power, greater than ourselves, is on the side of the creators. This call to creativeness involves the challenge that all is not well with the world—that the world needs to be made over. There is, so far as we can see, a certain dualism at the root of reality. Realization means struggle and overcoming, whether on a human scale or on a cosmic scale. This is the fundamental intuition that underlies all the great systems of idealism. The difference between ancient and modern idealism* is that ancient idealism faced the dualism frankly, while modern idealism has tried to get rid of the dualism by rationalization. In so doing it has lost the main *motif* of

* By modern idealism I mean idealism of the Hegelian type. For a sympathetic and illuminating account of modern idealism see R. F. A. Hoernle's *Idealism as a Philosophy*, 1930. For a more extended survey see S. W. Cunningham's *The Idealistic Argument in Recent British and American Philosophy*. For the Platonic tradition see John Henry Muirhead's *The Platonic Tradition in Anglo-Saxon Philosophy*.

idealism which is a call to creativeness—to making an indifferent world over into something better. It has become, in theory at any rate, an apotheosis of what is. The consequence is that the spirit of reform has sought other symbols such as utilitarianism and humanism. When traditional idealism has been used to justify the order that is, materialism has become the slogan of revolt, as happened in eighteenth century France and twentieth century Russia. It is imperative that idealism be restored to its original meaning—a program of reform.

It is not my purpose here to stress the differences in idealistic philosophies but rather the fundamental agreements. All the great idealistic systems have maintained with Plato that ideals or forms are ultimate and legislative aspects of reality and not mere accidents of cosmic weather. This means that mind or spirit has an ultimate rôle in the universe as a form-giving agency. Form, measure, number, beauty can be understood only as the creative activity of mind. There must be a community somehow between mind and nature, if mind is to succeed, however fragmentarily, in deciphering the language of nature. Back of all search for truth and all artistic interpretation is the conviction, however obscure, that the universe has meaning. Even the materialist tries to understand the world and, therefore, tacitly implies that thought is relevant to the world, though his rationalization makes it a mere accident.

* * *

The battle against materialism is far from won as yet. While the mechanistic view has been discredited in physics, it is still triumphant in biology and psychology. But as these sciences trailed behind the old mechanistic physics in a former age, so they must in time follow the lead of the new physics; and there are hopeful signs. So far as academic philosophy is concerned, the prevailing tone in the great universities of America during the last twenty

years has been atheistic. Philosophy is generally retrospective and in the Anglo-American world, at any rate, the full impact of the mechanical view of the world was not felt until the twentieth century when this view was becoming antiquated in physics. The real issue today, as in the days of Plato, is between naturalistic materialism and idealism—between those who believe that the sensible material aspect is the only reality and those who believe in the reality of form or structure, the spiritual aspect of the world. The epistemological controversies which have figured so largely in the philosophical literature of the period have been mostly verbal quibbles. The battles of realism against subjective idealism have been quixotic, since there is no subjective idealism except in the minds of critics.

I have great respect for those who have honestly and frankly championed the cause of materialism. I appreciate the fact that with their cosmological materialism they have often combined a social idealism. I suspect that their atheism is a protest against the mythological theology which they absorbed in their childhood and which has been as ineffective socially as it has been incredible intellectually. But much as I admire the intellectual honesty of my materialistic colleagues, I can not sympathize with their fanatical intolerance. However great may be our zeal for the truth as we see it, we should endeavor to be objective, remembering our human limitations and the prejudices of our intellectual climate. I would urge tolerance upon my atheistical friends. In the pitiful smallness of our knowledge, we should be willing to examine, in natural piety, the various hypotheses of the universe in order that we may discover what is best. We need have no fear for the truth. It will surely win out in a free field. It behooves idealists and materialists alike to remember the social law: "With what measure ye mete, it shall be measured to you again." We must beware lest the cycle repeat itself to its fatal completion. Shall idealism, after

winning its victory over materialism, degenerate again into irrational mysticism and authoritarianism which always block further progress? Is humanity doomed ever to oscillate from one extreme to the other? This can be prevented only if we keep an open field for thought.

But tolerance does not mean that we should have no convictions. The tolerance of indifference is an empty tolerance. The great difficulty with our religious attitudes today is their hopeless vagueness. We boast of our liberalism and talk patronizingly of the Middle Ages. But mediaeval thinkers strove with sincerity and piety to make clear their ideas of the great fundamental issues of religion in terms of their historic setting. So should we do in the historic setting in which we live. We cannot live in the past. It is for us to re-interpret the great themes of the ages in terms of our vital experience. But we either repeat formula of past ages which have ceased to have intelligent meaning for us or we lose ourselves in a fog of vagueness and sentimentalism. We forget that, if there is to be effective conduct, there must be clear thinking.

* * *

The critical issue of religion is what we think of God. On this issue depend all other issues that concern the religious view of the world. The conception of God is the heart of religious idealism. Our conception of God must make meaningful the far-flung galaxies in space and time which science has revealed to us, if the soul is not to despair in loneliness under the stars. But our conception of God must also give inspiration and reality to our ideal creativeness in the social crisis in which we live. Men have worshiped the golden calf and are perishing of hunger. Men have bowed before the robot of mechanical efficiency and have neglected the soul which must make mechanical efficiency its servant, if man is to prosper. We must make clear to ourselves what God means to us, if our idealism

is to be effective. Our conception of God is the measure of our values, and the consciousness of God is the inspiration which will lead us to strive for the higher values.

A conception of God which makes him a mere index of our human values will not serve. Such a conception is a mere myth, or rather, it is several myths since there are many values which men strive to realize and which seem to them most important at the time. The highest values of some men are little above those of beasts; and should we in our drunken stupor of this world crown such values as God, we may wake up to exclaim with Caliban:

> "What a thrice-double ass
> Was I to take this drunkard for a God,
> And worship this dull fool!"

No wonder that those who would substitute such a sentimental humanitarianism for religion advocate getting rid of the name of God as meaningless—the name which is charged with the racial aspiration of all Aryan history. The God we worship must be above the values for which men strive. In the consciousness of him our highest values must seem pale imitations. God is not just the personification of our wish, but the eternal inspiration to strive for the unattainable and to go under joyfully that higher values, which have not yet entered the heart of man, may arise. He is the infinity of perfection which urges us on, ever on, beyond ourselves, beyond man.

Nor can we be satisfied with an idealism so vague that it is in fact a mere "polite atheism," to use Burnet's phrase. The absolute of modern idealistic philosophies can not serve the purpose of a conception of God, because it is the mere logical abstraction of unity. An effective conception of God must emphasize selectiveness. The God of religion cannot be conceived as merely the whole of things. God must be conceived as an energizing spirit in the universe who furnishes the inspiration for creating an ideal realm of values—a kingdom of heaven—in a distressed and struggling world. A mere system of logic

cannot save the world, whether it be a speculative absolute or a "conceptual god" (such as Whitehead's) which is supposed to furnish the principle of concretion in a multitudinous world of occasions. Such a conceptual system is a mere impersonal abstraction. It has no reality, no value, except in the finite personalities which arrive at thought and appreciation. Nor can we worship a deity which emerges in the evolutionary process. We require a deity which is an active guiding factor in the process and through whose grace we can be saved.

We have arrived at a crisis in our conception of God. Unless we can arrive at a conception which is adequate to our needs—intellectual, practical and emotional—and which transcends our needs and can inspire us with higher needs, our conventional Christianity, as an effective force in Western civilization, shall surely perish. Not that Christianity itself will perish, for it is born out of the depths of the human soul and though it were destroyed by our treason to humanity, it shall surely recreate itself in the heart of humanity and go still higher. For Christianity is the good life, and the good life has its inspiration in the eternal source of goodness.

Chapter 2

THE IDEA OF GOD

We cannot hope to comprehend God, but without God we cannot hope to comprehend anything else. Therefore we must in piety endeavour to make the idea of God as clear as our finite limitations permit. As the scientist strives by imaginative pictures to understand the meaning of nature, so we must use our imagination to make clearer our relation to God. We must start where we are in human history to reach out into the beyond, making use of man's efforts in the past, yet not making the past an authority over us. The divine light must break in the here and now upon our souls, splitting like lightning the cloud of man's immemorial indifference.

Knowledge at best is a poor and abstract affair compared to the richness of human experience. We live in integral relations with reality. We are part of the dynamic wholeness of things. Knowledge is mostly an after-thought and always trails far behind reality. Nature and man have reacted to light for ages. But we have not yet a satisfactory theory of light. So man has lived in the presence of the divine through the ages. He has felt that his environment is more than what is present to the senses—that there is meaning and plot in the motley events of his experience. But his theories of the suprasensuous have been various and crude. Those who say that the suprasensuous is fiction because man's theories are various and conflicting, ought, for the same reason, to deny the reality of life and matter. The action of the great forces of reality is fortunately not dependent upon our knowledge of them. If it were, we could not live at all. For we know little of the great facts of nature—light, gravitation or even the energies which

have to do with the maintenance of our own organisms —and yet they have gone on through the ages. This does not mean that we should not try to understand, for the little we understand helps us to live more intelligently and effectively. To try to grasp the meaning of things and to live in the light of this meaning is the vocation of man.

Human thought has been prone to sever the natural from the supernatural. They are not divided. We may think of the piecemeal-point-of-view as the natural and the whole-point-of-view as the supernatural. In our work-a-day life we are too prone to act as if the former were all and as if the latter were of no importance. We must learn to appreciate that no part lives to itself or dies to itself. Within the whole the material order is part of the living order and the living order is part of the spiritual order, even as in our own organisms electrons, atoms, molecules, cells live their life within the field of the whole and can be only thus understood. There is a quality of the whole present in all the parts, and this quality of the whole makes the stone more than a stone, a tree more than a tree, a man more than a man in the separatist sense. The part is suffused with the meaning of the whole, charged with the pattern of the whole, and must thus be comprehended if it is to be comprehended at all. As we live in the community of matter and the community of minds without being able to rationalize the fact, so we live in the community of the divine. We act in integral situations, we respond to things within the living whole, though our analysis may grasp merely the parts. Because we are earth-born we are prone to look upon the material order as having priority. We seem to emerge from the lower stages of nature. But that is because we have not awakened to the higher causes. Matter, life, mind, spirit are eternally compresent in the cosmos. They are not divided in the integral whole within which we live.

Have we then an intuition of God? If what is meant is that we have an immediate intuition of one God—omniscient, omnipotent, omnipresent—as represented in mediaeval theology, then the evidence of the history of religion is to the contrary. Our concept of God, like our concept of matter, is the result of a long trial and error process to meet the requirements of experience. But acquaintance with reality must precede our theories of reality. This is true equally in the realm of sense experience—our relation to the external physical world—and in the realm of spiritual experience—our relation to other minds and God. If what is meant is that, in genuine religious experience, we have an immediate experience of the quality of the divine in our experience of reality as we have an immediate experience of colour, then I believe it is true. To say that religion starts in a unique immediate experience of the divine does not mean that we immediately understand the divine, any more than our experience of the sunset or the green grass or our fellow-men means that we immediately comprehend these facts as propositions. We live in integral relations, but we comprehend but little of what we live. The conviction for a larger reality—the reality of the physical environment, the reality of our fellow-man, the reality of the divine—is immediate. It is born of our inmost needs. It is of the tissue of the life of the race.

Our religious feeling is an experience of community with a reality which has a spiritual quality. Such a sense of community is more than a community with matter, more than a community with living organisms, more than a community with finite minds. The feeling for the supernatural is as unique and indefinable as the experience of colour or music. All definitions of religious experience are circular. They presuppose the very essence which they attempt to define. "Morality touched with emotion" is not a religious experience unless the emotion is a religious emotion. Religious experience is not

a feeling of dependence upon a power greater than ourselves, unless this feeling is a sense of community with a supernatural power of divine quality as well as quantity. Religious experience is not mystical absorption, unless we are absorbed in the divine. Otherwise, we could become religious by taking drugs. The mystical state is no criterion of its own quality. The religious experience, moreover, is not limited to some exceptional trance. Above all, the consciousness of the divine must be the guide and motive of our active waking life and give it transcendent worth. The religious experience cannot be characterized merely as awe or "shudder," because we can have the emotion of awe without being religious. We may experience awe in looking into an immense chasm, and yet have no religious feeling. The religious experience is not just an experience of value unless the value be religious value. The religious sentiment may have various ingredients—fear, admiration, love—varying from time to time, but these do not constitute the religious experience. This has its own unique quality. Our rationalizations of the religious experience must not be confused with the real experience itself. They are afterthoughts. Though we must try to give meaning, as we are able, to our experience of the divine, yet it infinitely passes knowledge.

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The reality of the divine requires no proof—any more than the existence of the external physical world or of our fellow-men—and to the sophisticated it cannot be proved. Nothing of importance can be proved. Life always turns out to be a venture of faith. The question is: Does the conviction of the divine illumine the world of which we are a part, does it give a new quality to life? One does not prove the existence of music or poetry or love to those that have the experience. The quality of the ninth symphony of Beethoven is real to those that

experience its beauty, though some cannot live it and therefore deny its reality. The quality of divinity is present everywhere to him who is qualified to experience it—as the quality of the artist is present in his work, as the quality of the soul is present in the behavior of the organism. But the immediate experience of reality needs in any case to be informed and cultivated by intelligent analysis if we are to enter consciously into its meaning. And this is a long and arduous process. Knowledge does not come as a gift. It is our faltering interpretation of first-hand experience. Knowledge cannot create its object. Communion with reality must precede rationalizing about it. The communion with the divine comes as a gift to those who are prepared, even as the experience of colour is a gift. We may never in all the ages comprehend God, but the quality of God's life is present everywhere. The sensitive soul responds to its influence as the plant turns to the sunlight and as flowers open to the morning dew. As we speak of life being geotropic—orienting itself to gravity—and heliotropic—orienting itself to light—so we should speak of it as theotropic—orienting itself to the divine.

Life, as Herbert Spencer truly saw, is an adjustment of internal relations to external relations, though we must bear in mind that it is a creative and not merely a mechanical adjustment. The impetus to adaptation must come from the environment. The organism, through creative reorganization, fashions an internal structure to respond to the structure of the cosmos. It is so that it fashions the organs for the characteristic responses of the world of sense. It is so that it fashions a structure to respond to our fellow-man. It is so that it fashions an internal structure to respond to the logical and aesthetic character of reality. It is even so that it comes to respond to the divine quality of reality. As we gradually become sensitized to the physical character of our environment, so we gradually become sensi-

tized to the spiritual character of our environment and acquire the proper organs for response to it.

In the dawn of mind the idea of the divine, like other ideas, is necessarily crude. Primitive man in his intellectual innocence felt the divine quality in his environment, but his imagination failed to grasp the whole. Man lived in the bosom of God, but his efforts to interpret the unseen were groping and pragmatic. Even before his fancy and his will-to-believe invested the things about him with life, he no doubt tried to get into rapport with the mysterious powers about him—not mechanically because he had no idea of mechanism, nor impersonally because he had no idea of personality. His efforts were for ages pluralistic and opportunist, dictated by his immediate needs. As he advanced in the use of language and abstract ideas, his fancy invested the environment with the qualities of which he had become conscious in his own life; and he developed systems of animism and personalism. In this soil the religious consciousness took form. Through hypotheses, conscious and unconscious, through his sense of the omnipotence of thought, man gradually moulded the fleeting impressions of his experience into schemes of things and values. Man starts with a sense of the divine. But the content in which he clothes the unseen must come through his experience. In the evolution of human experience, God is for man the great shepherd, the patriarchal father, the tribal chieftain, the judge and law-giver, the national lord, the friend and comforter in accordance with man's advance in social ideals. The idea of the divine varies with man's evolution, but through it all there is the core of intuition, the sense of presence, the need of rapport with the unseen.

The creative relations of God to man, God's attributes to us, are not stereotyped but vary with the development of man and with the social medium in which he lives. The radiance of God is coloured differently

through the different responsiveness of our souls. God is not static and immutable but enters sympathetically into our situations, just as we enter into the world of the child and become like little children. All the sincere relations of man to God are true attributes of God in our historic human relations. For God is for us what we experience God as being. The Greeks thought of the divine under many names because they experienced the divine in many ways. What God is in himself we can never know. We can know God only in his dynamic relation to our finite world. The divine presence re-creates itself in our souls in an infinite variety of attributes, to strengthen and to illumine. The divine is for the worshiper more than a projected social ideal, more than the elusive horizon of human progress. There is the conviction of a spiritual presence in the environment to which man must adjust himself. This conviction remains the nucleus in the varied interpretations which man makes of his relations to the divine. It is the haunting sense of the divine presence that leads to efforts at interpretation. This presence is the light that lighteth every man that cometh into the world.

Not only is the feeling for the supernatural, in primitive life, universal, but it is a dominating feeling, bending everything into its service. As Nietzsche, in one of his lucid moments, expresses it: "God is a thought that bendeth all that is straight, and turneth round whatever standeth still." The religious expression must integrate our whole experience of reality—aesthetic, scientific, moral—into a whole of life. Art, knowledge, morality find their ultimate motive in the belief in the unseen. They are woven like threads of tapestry into the religious view of the world; and this in turn gives unity to the whole life of man. So should it always be.

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The beauty of the primitive imagery of shepherd, father, king still retains its hold on our emotions. These

pictures contain indeed a sound nucleus in the faith which they imply in the guidance and reinforcement of man's better nature by the divine environment. But the idea of God must satisfy not merely our emotional nature, but our intellect as well. How pitifully small is man when he conceives the cosmos as the stage of his activity. How inadequate, and almost irreverent, become his anthropomorphic pictures of God. This feeling was expressed by the unknown Hebrew prophet of the Exile: "To whom then will ye liken me, or shall I be equal? saith the Holy One. Lift up your eyes on high, and behold who hath created these things, that bringeth out their host by number: he calleth them all by name by the greatness of his might, for that he is strong in power; not one faileth." . . . "It is he that sitteth upon the circle of the earth, and the inhabitants thereof are as grasshoppers; that stretcheth out the heavens as a curtain, and spreadeth them out as a tent to dwell in."[6]

The cosmic scale of God, which impressed the great poet of the Exile, makes it impossible to think of God in terms of our human economy. The difference is more than a quantitative difference. It is a qualitative difference. The pervasive genius of the whole cannot have our human limitations. His ways are not our ways. How shall we think of the being who creates in the infinitely large and in the infinitely small, who knows as the creative genius, that fashions our life from the cosmic weather, alone can know? How shall we measure the being whose years have no end, because the galloping years run their course within the cycles prescribed by his genius; who has no limitation in space because the curvature of space is set by his activity? How can we imagine such a being in the likeness of man who is but just fashioned in the ages by cosmic genius? Even our psychological functions are due to our limitations and cannot characterize a being who has the whole as his sphere of operation.

We must conceive God on a scale which can make him

effective in the world of modern science. This scale passes our imagination—the scale, in the large, of universes in space and hierarchies of universes separated from our world by millions of light years; the scale, in the small, of atomic planetary systems where the distances in comparison to the size of the entities are comparable to stellar distances. If micro-organisms of the order of electrons live within our organisms, and if they should try to understand the relations and structure within our organism, they would be confronted by a problem very much like that with which we are confronted in cosmic relations; and it is easy to imagine some sceptical micro-organism refusing to believe that there is any such whole as an organism but holding obstinately to the belief that everything happens by chance.

If the scale in space has been enormously extended, so has the scale in time—the vastness of the history of man which is but a brief span in the history of the earth, which is but a brief span in the history of the sun, which is but a brief span in the cycle of worlds. Man's conception of God in the past has been geocentric and anthropocentric. We must learn to conceive God on a scale which makes him equal to giving form and measure to all the worlds and all history. World histories with their cycles and interplay become the pageantry of cosmic genius, instruments in the cosmic harmony, movements in the divine symphony.

How then shall we conceive wholeness and structure in such a world as science discloses. We have become accustomed in these latter days to think of cosmic control in terms of fields. We speak of two universal fields —the gravitational field and the electromagnetic field; and we try to understand events in space and time as guided by these fields. As we conceive a gravitational field and an electromagnetic field, so we must conceive a spiritual field, enveloping like the "circumambient

air," pervading all the worlds, in the large and in the small, overlapping all other fields, measuring the units and constituting the structure, the soul of the whole. As we conceive material events as measured and guided by a cosmic field, so we must conceive all the events of history as measured and guided by a spiritual field so far as their inertia permits. We have an analogy in the human personality. The events in the life of the organism are guided by a whole-pattern—the field of the individual soul—which gives a unique quality to the individual. The particular cells in the cell division which constitutes the growth of the embryo might imagine that the division happens by chance, but we as spectators of the whole process know that there is a control—a whole-pattern guiding the development.

It is through the soul of the whole that energy is directed so as to find its place where it is needed in the life of the whole. The light and heat of the stars are not scattered at random and lost in the abysses of space to leave a cold and dead world as the materialists in their folly suppose. But all the pulses of energy are immanent in the life of the whole and circulate to the place where building or healing is to take effect in the continuity and maintenance of the whole, whether it is in our own body or in the vastness of the cosmos. Nothing is lost which is significant for the life of the whole. The light that goes out here is rekindled yonder, the life that goes out here is reborn yonder, the soul that disappears here shall be resurrected with a new body yonder, for it is the soul that makes the body, not the body that makes the soul. And wherever there is sincere need and longing, grace shall come and fill that need more than we can know. Only the trivial, insignificant and bad dies, not to rise again to life. This is the second death—the death of the individual—not the loss of energy, but the loss of pattern, the suicide of personality.

And now I see it in a flash, like the substance of a

dream: God is the spiritual field in which everything lives and moves and has its being—the field which guides the cosmic process, though the parts must adapt themselves to the structure of this field in their own way, according to their own relativity in their moving finite frames of reference. God is the soul of the whole, suffusing it with meaning, making possible the advance of nature—the emergence of new levels as matter is prepared to advance. In this enveloping, pervasive spiritual medium, worlds of matter float like islands.

It is spirit that overlaps. Matter owes its regularity, unity and dynamic structure to the fact that it is enveloped by mind, is controlled by mind. Cosmic space becomes the field of the infinite expansiveness of God and the rhythm of cosmic time becomes the reflex of the rhythm of his eternal activity. There must be space for the play of cosmic energies, and there must be the passage of time, else there could be no activity, no music, and the world were still-born, but there must also be the soul of the whole—eternity of structure, the sea of beauty.

Just as in the hierarchy of the human organism the lower centres take on a certain pattern and certain functions because of their integral relation to the genius of the dominant level, so nature assumes certain patterns and certain functions because these are implied in the genius of God. Yet even as in the economy of the human organism the lower levels, though guided and controlled by the higher, do not become in quality the higher, so nature cannot become God though it adapts itself in a measure to God and though its order is the expression of the genius of God. As in the development of the human individual the stages in the life of the embryo are not a matter of chance but due to the dynamic whole-pattern which guides the process, so the birth and cycles of worlds are controlled by the genius of the whole. If God withdrew his activity, everything would

lapse into chaos. Matter runs its course within the guiding field of spirit. The order of evolution is the genius of God. If the magnet attracts by producing an electromagnetic field, so God attracts the world to himself by producing a spiritual field. But the capacity and willingness of the parts vary. Hence the unequal organization or the lack of organization of the parts.

We must abandon our parochial point of view. God's creative activity comprises space and time on a cosmic scale. It furnishes the pattern of the passing events of history, eternally interpenetrating, incarnating itself as the material makes it possible. It reveals itself in an infinite variety of styles. It works through traditions, but it is not bound by any tradition. It creates fittingly in a variety of media, as the material lends itself to its genius. The God-stream of energy, like music, surges through cosmic space and time, communicating its quanta of energy to matter which in turn renders back the debt in the passing of the cosmic seasons. This stream is harmony, it is love, it is beauty. It pervades matter, life, mind, everywhere. It creates as it may through the history and inertia of matter. It establishes healing, atonement where it may. Here and there at any rate it is fruitful of advance. It destroys what cannot be healed—as light destroys what is not in harmony with it, as music shatters the walls that are not attuned to it. Terrible is the holiness of God, the love and beauty of God. You can be sure that the stream of divinity runs pure. It destroys sloth, sordidness and filth, but it is tender as the sun in spring to stimulate to life, creativeness, beauty.

* * *

We cannot account for advance in evolution without assuming a cosmic guiding genius. Everything moves within the field of divinity and each part responds by creative adaptation as it is prepared to respond. But

the milieu of response includes exchange of energy and interstimulation among the finite parts. Mutual aid is the mechanism through which the genius of the whole operates. We see this in social relations where progress is facilitated by the interstimulation and mutual aid of the parts, the more advanced furnishing stimulus to the less advanced—the latter responding through their own tradition and structure. It does not seem fanciful that cosmic genius operates through a community of worlds of different levels of advance, for it operates in human society through the interaction of different levels. Mutual aid is a law of the cosmos.

You may ask: If there is such interaction of levels in the cosmos, is not that enough? Why assume cosmic guidance? The levels and their interaction cannot be the result of chance. A cosmic equilibrium which could guarantee the compresence and intersupplementation of all the levels at any one time and forever must be due to a cosmic control as the rationale of such a structure. It could not be due to the accident of external relations. It is because of the Genius of the whole that there are qualitative levels in nature. Else all were merely the random play of matter, running its course to its own heat-death. It is the sustaining Life of the whole which makes possible the going on of the world; and it is the constructive Genius of the whole which contributes measure and pattern to the ceaseless change of nature. It is for us to discover this divine pattern and to strive to incarnate it in our own lives and in society. For there is as truly a viable pattern for a free and happy community of human beings as there is a pattern according to which atoms can live together harmoniously in a molecule.

There is furthermore the inertia and wilfulness of the parts; and the order, as incarnate in matter, at best lags and falls short, in varying degrees, of perfect structure, "the pattern laid up in heaven." If willingness or plasticity is an indeterminate fact, as it seems to be not

only in human experience, but all down the scale, the degree of approximation is not constant, but varies from cycle to cycle, and we have no guarantee against lapse in cosmic evolution. All creation that we know is through interaction. Everything realizes itself in groups from the atom to man. But by virtue of the urge of cosmic Genius creation may transcend the status of things as they are. Even though creation should run amuck because of the inertia and blindness of the finite individuals, which are part of the process, the creative urge remains. Even though the mortal instrument fails to respond, the harmony remains eternally in the Spirit of the whole and in the ages will create new instruments.

> There is no stoppage, and never can be stoppage,
> If I, you, and the worlds, and all beneath or upon their surfaces, were this moment reduced to a pallid float,
> it would not avail in the long run,
> We should surely bring up where we now stand,
> And surely go as much farther, and then farther, and farther,[1]

because of the Genius that works within the whole. But creation must proceed through the gamut of stages, with mutual aid and suffering. Certain it is that the perfection we strive for is always in the beyond. The reality which sets the standard and control must have an eternal status, not dependent on matter, though striving to express itself in matter. It must be absolute actuality, pure spirit.

Evolution from electron to man takes place in this divine field. Matter runs its course within the field of spirit. God is a solvent in which matter is resolved and reconstructed into new forms. God is music which tunes matter that it may respond to his harmony. But the capacity and willingness of the parts vary. There is always the inertia of the part to the superimposed motion of a higher level. God is not equally effective everywhere. The plasticity or willingness of the parts, as well as the activity of God, is involved in the advance of nature. The divine gift varies with the temperament, his-

tory and willingness of the individual. Hence the advance of nature is not uniform. Only a small part of nature shares in the advance to higher levels. Most of the amœbæ have remained amœbæ. They have not shared in the cooperative advance to a multicellular level. They find their equilibrium where they are. Throughout nature the saying holds: Many are called, but few are chosen.

This does not mean a limitation in God, but a limitation in the finite temporal process of adjustment. God's quality, God's eternal activity, God's eternal perfection, remain the same, whether we respond to the divine impetus or fail to do so. The rain falls and the sun shines on the just and the unjust. The quality of rain or sunlight is the same in any case. The great symphony goes forth through space, unspoiled in quality by the fact that there are few to appreciate it. God is the goal of perfection, viewed with reference to the growing and imperfect, but he is the energizing field through which the imperfect moves through its individual, racial and cosmic cycle to greater perfection, if it does so move. There can be no evolution of God, but all advance has its rationale in God. He is for us the meaning of the past in the sense that he accounts for the advance hitherto. He is the direction of the future as the unattained and unattainable ideal of our creative striving. But he is, in his own essence, eternal actuality, perfect activity.

To advance in the scale of life means to become more attuned to the divine field. What fails to become attuned to God degenerates—lapses towards the other limit, away from God, until it becomes mere raw material to be re-created from the beginning. Only that which responds to the divine impetus advances to new qualities and levels, and can play an enduring part within the whole. It has its own continuity in the economy of spirit. Its significance is conserved within the life of God, though worlds run their course and revert to nebulae.

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If we think of the material world as the body of God, we must not conceive the relation on the analogy of the emergent human soul and its body. The world is rather the body of God as sound is the body of music or as the instrumentation gives body to the harmony. But the ultimate harmony is in the medium of God. We cannot conceive God as dependent upon the material world as we, who emerge from the biological past, are dependent upon our bodies. For the divine spirit does not emerge out of matter, but matter owes to the divine guiding field its ascent of emergence into new types and levels of organization. God works perpendicularly, as it were, to the stream of evolution, while matter advances horizontally, because of the guiding impetus of the divine. The divine is not dependent for its existence upon matter, but matter is dependent for its organization upon the fact that it moves within the divine whole. In this whole, different parts of the material world run their rhythms, rising or falling in the scale, but all the cycles owe their order to the harmony of the whole, even as the cells in the healthy organism run their cycles in obedience to the controlling pattern of the whole. In the symphony of divine love, time and eternity are complementary. For love is love of movement, development—the development of the life of a child, of the plot of the drama, of the theme of the symphony. Yet through it all there is the soul of the whole.

In a higher sense than we can know in our truncated development, God is the soul of the cosmos, the spiritual field in which all things move and which suffuses all things and gives order, meaning and beauty to the world so far as it is responsive. We perceive his genius throughout the levels of patterns in nature—atom, molecule, crystal, cell, plant, animal, man—working with the material of electrons or whatever is the ultimate material, subliming it into more and more spiritual structures. But we must not think of God as being either

qualitatively or quantitatively like our soul. When we speak figuratively of our soul, as a spark of divinity, we emphasize quantity too much. The induction of soul is limited by our history and inertia. Soul with us is largely potential, forward-looking in its creation. It is a fragile thing, emerging as it does in the biological process, dependent largely on its organic instrument and realizing only prophetically its wholeness of meaning in this existence. Its immortality is something to be won by its free effort. But the spirit of God is intrinsically eternal.

We cannot hope to understand the relation of the Universal Spirit to the world of his creation. We know mind only in its embodied form as ensouling an organism. Even so, mind is not just a function of the organism but uses the organism as its instrument for expression. It is the soul which is the architect of its body, rather than the body producing the soul. Nor is our mind limited in its expression to organic behavior. It expresses itself also in spiritual symbols and in spiritual patterns within a spiritual community of minds. The spiritual body of tradition is even more important for the expression of mind than the material body. God as the soul of the whole has the whole of creation, with all its levels and interrelations, as his medium of expression—not only the whole physical cosmic system of wave harmonics, but also the living cosmic community of wave harmonics, for we must conceive life, as well as matter, as a cosmic community though bound up with material organization. But more especially is the cosmic spiritual community, with its fusion of spiritual histories into a unique and varying symphonic whole, the medium of God's expression, for we must conceive mind as interrelated not only in our human social field but also in a cosmic spiritual field with its own harmonics, overlapping and controlling the physical and organic fields.

If the moving panorama of the physical world, whether

on the large scale of the heavens or on the small scale of the atoms, inspires us with wonder at the genius of God, how much more should we wonder at the expression of his genius in the procession of life in its varied and progressive evolution. And even this expression pales into insignificance besides the revelation of the genius of God in the procession of mind in its creation of institutions, science, and art. This whole cosmic system of interlaced harmonics, with its physical, organic and spiritual levels, is the finite body of God's expression and exists as his free expression. If even our limited mind can become emancipated from its organic cravings and use the body with its mechanisms as an instrument to create in the realm of spirit—no longer limited to the material and organic conditions but expressing itself with infinite variety in the realm of spirit in the creation of new ideas, new symphonies, new spiritual bonds of communion—so to a supreme degree we must conceive the Universal Spirit as a free spirit creating new harmonies, world without end, in the realm of spirit.

God is present in his integrity everywhere. His energy does not weaken as the mediaeval thinkers supposed who imagined God as radiating from beyond the crystalline vault through a fixed spatial hierarchy of creation down to our earth, even as the sun radiates its light into space and weakens in effectiveness with distance. We know there is no absolute up and down in space. Moreover, the hierarchy of values has nothing to do with relations in space. God surges through the whole: His presence is the same everywhere—all eyes, all ears, all thought, all love. God is present in his unique essence in all things. All things run their course within the divine creative field. But God is not the soul of things in their particularity. The essence of God is not that of the finite individuals. They are not pieces of God. The pattern of the finite differs qualitatively from God. In the inspired language of St. Thomas Aquinas: "God is said to be in all

things by His essence, not indeed by the essence of the things themselves, as if He were of their essence; but by His own essence.'"[8] Just as when I try to persuade you of my purpose, I act by my own pattern, but you respond through your own life-history, assimilating or rejecting my purpose, so God acts through his own genius, but we respond through our own unique individuality as we have the capacity and willingness. God does not include us in the sense of abrogating us, though he works in us and through us. God is thus omnipresent without being everything. When we are in tune with God's purpose we are indeed included in the life of God, but we are still individual patterns and wills. If God does not thus include us we are dead to God and God is dead to us. Then are we dead indeed.

God is both immanent and transcendent. There is no contradiction in this if we realize that God is immanent and transcendent in different respects. God is immanent in his activity, in his pervasiveness and control—streaming through the cosmos like ether, fragrant with meaning and value. His presence gives a unique quality to the whole of nature, as our mind gives a unique quality to every part of our body. But as our soul transcends in quality the physiological levels of our organism, so God is transcendent in quality with reference to nature and evolution, for nothing rises to the quality of God. Everything finite is perfect when it realizes its own quality. But the quality of the finite is not the quality of God. At best we recognize our imperfection. But in God is no imperfection, no potentiality. The glory of the perfect is greater than the glory of the imperfect. The more perfect the activity, the more it is its own joy, and the more it is like God.

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The consciousness of the divine may come to us as the limit toward which we strive but which exceeds our finite attainment.

A man's reach should exceed his grasp,
Or what is heaven for?

The reason that a man's ideal exceeds his grasp is that it expresses in a penumbral way the feeling for the whole of life—the divine Presence—for the quality of the whole is present in some degree in every part. It is only of God incarnate in cosmic evolution that we can have conceptual knowledge, relative though this is to our finite imperfection; we cannot know God in his own essence. This is forever beyond us.

The divine life is not a limit in the sense of the unknowable which ever recedes farther with the advance of human knowledge. It is a limit in the sense that it gives meaning to the process, as the limit in an infinite series gives meaning to the series. But the object of our religious striving cannot be merely a limit at infinity. It must be a present actuality, stimulating the imperfect and finite towards the approximation to truth, beauty and goodness. The religious life means contact with the perfect; and it means, in however relative and halting a way, incarnation of the divine and approximation to the divine. The religious consciousness gives meaning and vitality to the whole striving of man. It creates unity and harmony in the life that now is. It is not just a limit in the future. If it were merely "a far-off divine event," it could not guide and stimulate our present striving because we should not be conscious of it.

Our consciousness of limitation is not in itself a transcendence of limitation as some have thought.[9] Life would be a simple thing if that were so. But we may see the mountains without being able to see beyond. Our consciousness that we do not understand the chemistry of life is not the knowledge of the chemistry of life. It is at most a challenge to further research. The wish to transcend the limitation is not a transcending of it, though it is a condition of advance. We may be farther away from the quality of God than the amœba is from our quality.

The consciousness of the divine may come to us as the law or direction of life—the *nisus* of our historic and individual striving. This *nisus* toward the highest level, which we call God, is not due to the unaided impulse of matter. Qualitatively God must be conceived as a reality beyond material incarnation—a pure spiritual level, expressing itself through matter and becoming known to us through this expression. The higher level in the advance of life does not merely emerge from below, but implies a stimulus from beyond and the creative response of the finite to this stimulus. The order, beauty and love of the highest level must radiate through all the levels even to inorganic matter and its evolution. For it is to the highest level in the cosmos that the lower levels owe their order. This highest level both radiates energy patterns and receives energy from below without loss, since in the cosmos there is action and reaction and nothing is lost.

But when we speak of God as the highest level in the cosmos, we are speaking merely in a qualitative sense. We do not have reference to space or time or dependence upon lower levels. God is not to be conceived merely as the highest level of evolution, but as an independent life. This life permeates and envelops all that is in space and time. God is not dependent upon the process in space and time, but is the field within which the process moves. All order depends in the last analysis upon the structure of this divine field. But this depends upon nothing. It is self-contained in its perfection—the perfect symphony—though its creative love goes out to all. Through the genius of this soul of the whole, the constancy of levels and the equilibrium within the whole is guaranteed. This structure is constant, however much the content of our finite realization may vary.

Best of all, the consciousness of the divine may come to us as a sense of communion with God and in rare moments as a beatific vision. This intimate realization

of divinity can be grasped only by those who have had the experience. To have communion with God it is not necessary to be God. To commune with light it is not necessary to be light. But in the communion with God we live God as we are able. The kingdom of heaven is always at hand. The divine life is always a present reality, permeating our very being. But to live God absolutely means to have the quality of divinity.

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If we think of divinity as a field in which we live and move and have our being, we must not conceive it as a static field—a field of local oscillation. We cannot conceive of the highest life as still life, but we must think of it as ceaseless creative energy which works until now and forever and which has unity of direction. God is not a neutral medium, but a medium with structure—not a passive, rigid, structure, but a living dynamic structure. It is the eternal motion of God in his own medium and in his own perfection which creates a magnetic field to draw all things to Himself. We must further recognize the quality of the field. In the human economy we have a hierarchy of fields in which the higher field furnishes guidance to those below it—mind being the highest field. And mind of a level which is conscious of its aim and strives to realize the whole of life we call personality. The divine must not be conceived as an impersonal field; it suffuses the cosmos as soul, as creative intelligence. God's life, it is true, cannot be characterized as personal in our imperfect sense—limited as we are by our material evolution—but it cannot be less, rather must it be inconceivably higher than what we mean by personality. It is not community in the collective sense, but of it community is the expression as a higher medium than material body—a spiritual body in which personal realization is made possible.

The divine medium which envelops us is a warm, in-

timate medium, penetrating and suffusing everything. It is the noblest of sayings that God is love. Love and friendship are the choicest fruits of the tree of life. And love means a begetting of harmony and beauty. God is purifying love, constructive love, healing love, pervading the cosmos. Like loves like. Because God is harmony, God loves harmony and creates harmony in us. God, like the human artist, has affection for the matter in which He works. God is friendly, ever-present spirit, brooding over the deep, ever seeking expression in matter and spiritualizing matter so far as matter lends itself to spirit. For matter varies in its capacity to express spirit —in marble, in colour, in tone, in words. Life is a more adequate medium than the inorganic; and of life there are many degrees until we reach mind which can participate consciously, however partially, in the objective pattern. But of mind, too, there are many qualities. There are rare minds who seem to be on terms of intimacy with the objective spirit—who catch the divine enthusiasm of the creative love which surges through the whole and out of which is born the impulse to create harmony and beauty in our world of relativity. But at best the divine harmony is limited in our world by being expressed in the indeterminate material of the finite. The glory of the imperfect is only an imitation of the perfect.

We must think God in terms of what we know. He is order, He is life, He is intelligence, He is beauty, He is love, He is goodness. We must think Him peculiarly in terms of the highest which we know—personality, creative intelligence, creative beauty, creative goodness, creative love. And love delights in variety and novelty. But we must think the highest which we know on a cosmic scale—a scale of infinite space and infinite time as the theater of God's activity. We must think of his activity as perfect and spontaneous—not the stumbling trial and error process of even the highest genius. Somewhere and always God's expression is being realized. He

is the perfect organization to which our creative reason strives to adjust itself, as the eye adjusts itself to light. There is a difference in quality, not merely degree, though we cannot comprehend quality higher than the highest human. He is for us in the future, but existing actually in his own perfection. The world in its order and beauty is his expression and is somehow beautiful, even though not all the parts are beautiful. The world without God is unthinkable, except as a limit. The world without God would be devoid of order and meaning.

Somehow, above us and within us and within every part, there exists the fashioning Genius of the whole. We have at best only a vague intimation of this presence. We cannot comprehend it, for in our world of relativity we must perceive and assimilate God from the point of view of our finite history. We conceive Him as the law of the whole, contributing order and pattern to the flowing interacting energies of the universe, establishing measure and compensation amongst the parts, making the pageantry of the cosmos into a significant dramatic whole. But He is more than law, He is love. And creation is the expression of his love. In his love He purifies and re-creates the parts, as they are willing. In the cosmic seasons He is present at the birth and death of worlds, conserving out of the dissolution that which is significant in the world of spirit and starting the experiment anew. Material worlds are but play-houses to liberate spirit, and to realize the beauty of spirit. Civilizations are like the snow-castles which the children build for an hour. They arise and perish, and the earth too shall perish with all its beauty. But spirit is eternal; and from the point of view of spirit the chief importance of the cosmic drama is the emergence and salvaging of spirit. The harmonies which have been embodied in the perishing world of matter shall be embodied again, and even now are being embodied elsewhere. The energy patterns of divine genius are ever going forth from world

to world along the curved lines of cosmic structure to direct and to become incarnate in the fulness of time.

In this multiple, many-coloured, changing world, God is ever present, working to create new symphonies world without end. He ever stimulates the parts that they in their history may incarnate his genius. God is perfect yet reaches out in his love to all imperfection, to order the chaos of our lives into some sort of whole. God works everywhere for atonement, because God is harmony and strives to produce harmony. Creation, incarnation, salvation are one process. The birth of a beautiful soul or of an institution, ampler to realize human freedom, is as truly creation as the birth of a star and is a higher expression of divinity. All incarnation is a creative transformation of the finite. As an expression of divinity in the temporal process it is limited by its matter. Even the unique incarnation of divinity whom the Christian world has worshiped—the incarnation in Jesus of Nazareth—is conditioned by human nature and history.

The divine stimulus is ever the same. Divine grace is impartial and overflowing, to transform all that is into beauty, so far as the inertia of the finite permits. Within the economy of the divine whole everything contributes its typical share, as every part of the body contributes its share to the life of the organism, but the genius of the whole in turn transforms and sublimates in its creative unity all that it receives. The whole as incarnate in the cosmic process is never complete. There is ever an urge towards greater wholeness, for along this line lies the possibility of health, cooperation, happiness. Parts may strive to wander their own centrifugal way, but the schoolmaster, pain, brings them into step, however haltingly, with the music of the whole or else they perish. Not even the tragedy of some parts can prevent some sort of harmony, though the harmony might have been different since our part might have been different. Our destiny, whether salvation in being tuned to the harmony

of the higher, or damnation in resting satisfied in the lower, lies in our willingness. God is ever stimulating to the higher.

"Behold, I stand at the door, and knock; if any man hear my voice, and open the door, I will come in to him, and will sup with him, and he with me." O! the infinite patience and persistence of God—ever knocking, knocking, knocking at the door of our consciousness, never wearying, never letting up. He radiates perpetually his light and grace through the cosmos. Through his formative genius this cold clay-clod becomes instinct with life, and in the fulness of time it becomes possessed of soul. His energy beats against the sloth of our individuality until perhaps the inertia is overcome and his presence floods the soul with beauty. "He hateth nothing that he hath made." Continually as gravitation He works to attract us to Himself. Wherever you are, and whatever you are, if you will assent and cooperate, He will transform your sordidness and create communion, harmony, salvation.

Shut not yourself up within your petty desires, your discontent, your self-centered thoughts. God wills life, beauty, salvation. Your unhappiness is not of God's willing. He seeks no revenge for your sins. He only seeks atonement. God cannot enter your life without your willingness, without your asking and seeking. But He is always ready to transform your life with beauty. To isolate yourself from God is death. To open your soul is life and joy for evermore. As through the ages light has beaten upon matter, that matter might respond with organs to see light with all its beauty, so through the ages the radiant energy of God beats upon this dark world that it may form organs to respond to his beauty and grace, that He may enter into communion with you. Let not his light return to Him without avail. Yours is the gain, the glory, the happiness. Our life is drab and grey

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unless it is illumined with the sunrise touch of divinity.

While God is known to us as expressing Himself in levels of inferior quality, including ourselves, it seems reasonable to think that God may and must express Himself in kind, that He craves communion in kind, in his own medium of pure spirit, the eternal circular harmony which issues in God and returns to God, as well as expressing Himself in the upward movement of the evolutionary process to which He gives the impulse to reach out for the divine and to incarnate the divine as it is able. Just as we crave companionship, not only with nature below us—inanimate nature, animal nature, immature human beings—but also and especially crave companionship with our own level of development, able to give soul for soul, love for love, to share our plans in sympathy, so we may in all reverence conceive that it is not good for God to be alone, but that God expresses Himself eternally in kind, God of God, light of light, youth of youth, in his own beauty and loveliness of which all other beauty and loveliness is but a feeble imitation.

God sings a song, the eternal song of love, older than the morning stars—the song of songs, the symphony of symphonies, in which God is well pleased, in the love of which there is perfect bliss; and the song returns in love to Himself and God loves his child which is the expression of his very soul; and because the child is the soul of his soul, it loves Him as He loves it. God is not doomed to statuesque solitude in his own medium of pure spirit. While the "Word," as the creative energy of God, coursing through all the cosmos—loving, suffering, dying, rising again in victorious atonement in its incarnation in the finite struggling world—does not return to God in vain, in the evolution and devolution of worlds, yet the accomplishment is but a relative accomplishment, so far as the expression in the finite is concerned. But the loveliness of God's unique expression and birth in beauty in his own spiritual medium is the perfect fulfilment of the

highest love—fairer than the sun, sweeter than the moon, surpassing infinitely the beauty of earthly art—God at harmony with Himself. This passes our comprehension. We can only realize it feebly in that rare joy which comes to us when we meet an understanding spirit—soul of our soul—in which our friendship and love find exquisite satisfaction. But this is an imperfect image of the love of God.

We live in a world of mystery. We invent symbols in order that we may come into rapport with reality, but reality is always more than our symbols. The symbols are but instruments for putting ourselves into a condition of having experience of reality. The experience itself is ineffable. We cannot define colour. The scientist's symbol for light is not light, though the relevance of the symbol helps him to come into rapport with light. By grace of nature man has enjoyed light for ages, though he has had no understanding of light. Science has been a long time in discovering a relevant symbol for light and even now it is a halting symbol. But it has proved effective in putting us into greater rapport with light and so increasing our opportunity for the enjoyment of light. We invent symbols for life. We classify it and analyze it, but life itself is a mystery which we can enjoy only by living. We invent spiritual symbols in order that we may succeed in a measure in coming into rapport with the spiritual forces in our environment. But language and art are not spirit. They are only instruments of spirit. We must live in spiritual relations to realize the significance of spirit. Spiritual communion is itself ineffable. We cannot explain friendship.

God is the greatest of all mysteries. Man in his history has invented symbols of the divine. However inadequate the symbols, they have helped the devout in spirit to come into rapport with the divine. Only by coming into rapport with the divine Spirit can our spirit complete itself. We must think about God if we are to commune

with God. So man has invented symbols—formulae and sacraments—to orient his spirit to the divine. He has striven to create favorable situations, artistic and devotional, to put himself into a frame of mind to commune with his God, but communion itself, like the manna from heaven, comes as a divine gift to those who are truly devout. It is an ineffable experience. Our symbols are at best infinitely inadequate. If we cannot understand light or life or mind, how can we hope to comprehend God? How can we comprehend a being who exists eternally in his own perfect harmony, yet becomes incarnate in time, suffers, dies and is resurrected again in history, who is universally the same and yet is present intimately and variously in every devout personal experience? Yet we must invent symbols to express what God means to us, however inadequate they may be, for God does not reveal himself to the thoughtless. We may think of him as music which in its own harmony pervades the universe but is re-created differently in every devout listener. We must remember, however, that music is only the expression of spirit and therefore only a symbol of spirit. Yet music seems the most adequate symbol. To be saved is to be attuned to the eternal harmony, to find the unity of our life in communion with God, however inadequate we are to enter into the richness of his harmony.

Even as I write there comes across the continent,* on the mysterious wings of radiant waves, Wagner's music of Parsifal's quest for the Holy Grail. The symbolism is mediaeval, but the quest is eternally human—the longing for a harmony of life which the world cannot give. As I listen the noises of a busy city obtrude themselves through the open window. But they are not part of the music. The music is distinct and complete in the midst of the noises. The music pervades the ether independently of the turmoil of the air. It comes directly anywhere to the heart that is equipped with the proper physical and

* From the New York Philharmonic Orchestra, Carnegie Hall.

spiritual instruments. It comes with its own harmony. It does not unify the noises. All spiritual harmony is a selection and a creative synthesis. Even when we fancy that we recognize in a symphony the sounds from the barn-yard, the rushing of waters, the song of birds, the thunder of the storm, these are not the symphony. The sounds have been selected and assimilated into a transcendent whole. Only what is relevant can enter into the symphonic harmony. The world is not a spiritual harmony, but in its confusion a harmony can be selectively created. The divine life is a harmony which can possess us even now, if we are willing to become attuned to it. Then we are in the world but not of the world. It is certain that in our spirit is the longing for a harmony which can unify our life and make significant our striving. That this harmony exists somehow is the deepest conviction of the human spirit. This divine Presence is something that can be experienced as truly as music can be experienced. The immediate experience of it does not depend upon the adequacy of our symbolism, any more than the experience of music. The lowliest who are devout in spirit may have this experience. But the meaning of it for us requires the expression in symbolism. And the experience itself grows with the expression, when this is a genuine expression and not merely outward show. Thus in the ages God has fashioned us for communion with Himself, and we shall ever be restless and thwarted until we find our consummation in Him.

Chapter 3

GOD AND COSMIC STRUCTURE

It is a momentous venture to attempt to frame an hypothesis of the universe. But if we reflect upon the meaning of life, we are obliged to make such an effort. The only way we can escape such responsibility is to be guilty of man's great refusal—the refusal to think. If we frame an hypothesis, it should be such as to assign the proper significance to all the facts of human experience—not merely the physical facts but the biological and mental as well; not merely our scientific interests, but our aesthetic, ethical, and religious interests as well. And it should do so in the simplest possible way. It would be futile and impossible to examine all possible solutions. Henri Poincaré proved long ago that if there is one hypothesis of a class of phenomena, there are an infinite number of hypotheses. We must follow the example of science and work out from the significant efforts in the past. We must try to discover the hypothesis which is most probable. In general we may say that the theories of the universe fall under two fundamental types. One type starts with the assumption that the world is a shifting heap of elements which arrange themselves by external relations. This type of theory denies any guiding whole, whether in the small or in the large. The opposite type of theory presupposes that the events in the universe are guided by form or pattern. In a broad sense it assumes that the universe is in some way organic, i.e., that the activities of the parts have reference to one another and to the whole in such a way as to supplement one another and to promote the continuity and harmony of the whole, though the indeterminacy and inertia of the parts limit the realization of such harmony in our world of change.

We may assume the doctrine of evolution "in the broader sense of the continuity of the physical universe throughout all time, and the orderliness of the processes of change which go on unceasingly. Every physical unit which we recognize in nature—electrons, atoms, crystals, cells, stars, galaxies—has at some time come into existence and at some time in the future will pass out of existence; and furthermore the manner of their coming and going is quite orderly, and, within certain limits, is even predictable."[10] But we must keep in mind that nature is not just one evolution "from the homogeneous to the heterogeneous with the corresponding dissipation of motion," as Herbert Spencer conceived it and as it has been the custom to conceive it. Even S. Alexander, in his *Space, Time and Deity,* thinks of evolution as a one-way process where everything, including Deity, emerges from an original matrix of Space-Time. Alexander's Deity is earth-born. To conceive of evolution as one history is to think of it as a finite drama, where the curtain is rung up on an original distribution of elements—however they be conceived—and is rung down with the dissipation of the available energy. This leaves the beginning and the end in the dark. Evolution as science conceives it, on the basis of the available facts, is multiple. There are an indefinite number of cosmic histories at various stages of integration. In some way these histories must sustain a give-and-take relation to one another, so that the available energy is kept constant. Running up and running down, expansion and contraction are relative, depending upon the frame of reference. For we do not conceive of the cosmos as running down, though we know that individual parts run down. The cosmos must be conceived, not merely as a dynamic equilibrium, but as a living dynamic equilibrium of such structure or "curvature" that the loss of available energy in one part is compensated for by an equal increase elsewhere, for only a living equilibrium can be

self-sustaining. This conception of equilibrium must apply to the organization of energy as well as its intensity. Energy apart from organization is an abstraction. There is not *one* evolution, but an indefinite number of local evolutions, with compensations amongst them. This is implied in our conception of the universe as a going concern.

The real question then is not, What does evolution in general mean? The cosmos as a whole does not evolve. The question is rather, What does local evolution mean? And the local evolution of which we are a part, viz., the evolution of our earth, has naturally a special interest for us. The theory of "strict emergence" holds that new forms, characteristics, events, arise from a state of affairs in which these novelties did not exist; and this happens without any guidance whatsoever, immanent or transcendent. According to the probability of chance, if you shuffle certain elements, any combination can occur in infinite time. To be sure, science does not allow infinite time for the cycles which it studies. On the contrary, evolution in any one cycle, including an astronomical cycle, takes place in a finite and calculable time. But the emergentist points to the fact that the configurations in question, with their novel characteristics, have occurred. On our earth such configurations as possess the characteristics of life and mind do exist. All we need to do is to examine what sort of configurations give rise to such properties as life and mind. In this respect emergence is merely descriptive.

The theory of emergence need not commit itself to any special conception of world stuff. It may, as W. K. Clifford's philosophy does, start with mind-stuff. It may assume with Haeckel that the simplest matter is endowed with soul. But the emergence theory now in vogue calls itself "materialistic emergence," which means that everything emerges from "configurations of matter." This theory owes its plausibility to the fact that it as-

sumes the nineteenth century conception of matter and mechanism. Just now it would not be so easy to say what is meant by matter and configurations of matter. It is certain at any rate that the billiard ball model of the seventeenth century is no longer applicable. R. D. Carmichael has well summed up the present plight of mechanical materialism: "It is absurd to speak of a mechanical explanation of life and thought when we have found ourselves in such difficulties that we no longer know what we should mean by a mechanical explanation of phenomena not involving life."[11] But, as Hegel with great sagacity observed, when philosophers arrive on the scene, the owl of Minerva has taken its flight.

The conception of the world which is implied in the science of today gives the lie to the idea that the world as it is can be accounted for on the probability of mere chance. On the contrary, it makes necessary the conception of *cosmic control* or *cosmic structure*. The quantum of radiant energy is universally measured. The electron carries a constant charge throughout the cosmos. The shifting of an electron from one energy level to another is constant for the various elements. Hence the identity of the spectra of the various elements wherever observed. The organization of matter is the same everywhere. The atoms have the same patterns and fall into the same natural order everywhere when the conditions permit. The only difference (aside from mass) between our earth and the sun, and between our sun and other stars is a difference in temperature, permitting the organizing process to take place. Matter, moreover, has no privileged character. Matter and the patterns and laws of matter emerge in the various local histories. But there is correspondence amongst emergent histories, and such universal correspondence cannot be accounted for on the probability of chance. The postulate of the uniformity of nature may in a broad sense, be predicated throughout, from nebulae to the most advanced types of organiza-

tion, such as human intelligence. Any *ad hoc* hypothesis which violates the law of the uniformity of nature must be treated as suspect. But the uniformity of nature is possible only because of a universal cosmic control. Moreover, if the stages of nature which we are able to observe, are universal, we are justified in holding that this uniformity of nature holds for evolution at all the stages, though we must allow for variations due to local conditions.

Our information in regard to the structure of nature outside our earth is scanty enough. We have established the law of the uniformity of nature only within the realm of inorganic nature. We have no direct evidence of the appearance of life outside our earth, unless it be on Mars. But the implications of the evidence, which we do possess, are far-reaching. The universality of the structure of matter, within the limits of our scientific observation, shows that the cosmic control which we must postulate operates as mathematical genius in the sense that we can discover number and measure in nature. This means that the laws of logic, whatever they may be, hold for the entire universe. The human intellect is at home in nature. "Even inorganic matter," to quote Trystan Edwards, an artist, "is everywhere subject to the laws of logic which are essentially intellectual." Moreover, the architecture of nature is such as to give aesthetic satisfaction. The principles of aesthetics, whatever they are, may be said to be universal. Cosmic control operates not only as mathematical genius, but as aesthetic genius. A scientific hypothesis, to be acceptable, must satisfy not only the demands of convenience, but our aesthetic demands as well. Simplicity, unity, harmony are in the last analysis aesthetic criteria. Art has its claims as well as science and indeed possesses a logic of its own. While the human mind is a local emergence, it finds that its structure is universal, i.e., it applies not only logically but everywhere. This is no accident. The emergence of mind

locally may be due to temperature conditions, but its relevance is universal. Hence we must conclude that it owes its character to cosmic genius. On the basis of present science we are justified in ruling out emergence by accident, i.e., without cosmic guidance, as incredible. The uniformity of the constituents of matter and of the structure of matter could not result on the probability of chance.

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If we assume *guidance* in the evolutionary process, we must try to see how this guidance operates. We need not here consider fiat creation, such as has been attributed by theologians to the first chapter of *Genesis,* since such an hypothesis cannot be regarded by philosophers as a living option. There are two types of hypothesis of interest to us—one is that of preformation and the other that of creation, i.e., emergence under guidance. Strict preformation means that the structure of any history, whether individual or cosmic, must be immanent somehow in the process from the beginning, in order to guide the development towards the observed outcome. Preformation, like emergence, takes a local view. It fastens its attention on the particular history and holds that the form or structure of the final stage must have been immanent throughout the process of development. The philosopher who is usually regarded as the author of the hypothesis had in mind exclusively embryology. For Aristotle, species are eternal. Evolution, therefore, means individual genesis or ontogeny. Even here individual characteristics emerge in the process. It is the formative impulse which is present from the beginning. Aristotle is not a strict preformationist even in embryology. Hans Driesch has tried recently to revive the Aristotelian conception by holding that we must assume an entelechy as guiding the genesis of the embryo. Driesch, like Aristotle, limits the hypothesis to embryology. He

is no clearer than Aristotle as to how the individual entelechy originates, though of course in some way it has reference to heredity. Preformation as a special scientific hypothesis must be fought out in the realm of science. We are interested in the emergence of structure. This means the relation of the emergence of structure in the individual to evolution generally, not merely the origin of species and other structural characteristics of life, but the emergence of life from matter and the emergence of matter itself, as we know it.

Is it possible that the whole evolution of life with its branching and radiations and its progressive manifestation of structure is latent in the first beginnings of life and not only in these but also in inorganic matter back to its primitive constituents? The Stoics were the only consistent preformationists in ancient times. The seeds or germinal reasons are supposed to be latent from cycle to cycle, when everything returns to fire and proceeds from fire again, each cycle repeating to the minutest detail its predecessor. But they do not show how the seeds could be latent. Leibniz in modern times developed a thoroughgoing preformism both in cosmology and embryology. But in cosmology he required a *deus ex machina* to make his theory possible; and in embryology the microscope has refuted the presence of a homunculus or miniature man in the early stages of embryological history. A recent vitalist, Henry Bergson has, unintentionally I think, offered a suggestion of universal preformation: "Life," he says, "does not proceed by the association and addition of elements, but by dissociation and division."[12] Everything is thus present in the original vital impulse. It is like a rocket shot up in the air which, owing to the resistance of matter, splits up into its manifold inherent impulses, thus giving us the display we see. But matter for Bergson is not real. It is the mere downward trend of life. Reality is fundamentally life and consciousness. Bergson, however, has not seemed to see the implication of his theory of dissociation, or he

would have seen its inconsistence with his idea of evolution as creative synthesis. The solution is probably to be found in his implied pantheism in *Creative Evolution.* In a later statement however, he professes "the idea of a God, creator, and free: the generator at once of matter and of life: whose creative efforts as regards life are continued through the evolution of species and the constitution of human personalities."* Bergson has not yet shown us how he would account for evolution on this basis. What is the relation of God to the evolutionary process? If God is eternal, what is his relation to evolution? It was easy for Hegel to say that the absolute is present in the beginning, wherever you begin, because reality is fundamentally a system of dialectical implication and hence eternal. But that does not account for evolution.

We may say, I think, that there is not, at present, a theory of strict universal preformation, i.e., a theory attempting to account for real evolution from nebula to man on the basis of a structure latent somehow in the process from the beginning and only waiting to be called forth under specific conditions. Even if we could conceive of such preformation in individual histories we should still have to account for the intersupplementation of such histories into a cosmos. Leibniz, who did conceive of reality as made up of an infinite number of preformed individual histories (every history having its own entelechy or inner principle of development), was obliged to add the hypothesis of a pre-established harmony to account for the correspondence of these histories. God like a clock-maker constructed the monads so that they would run in unison. But such an appeal to God to make good our failure in scientific theory is out of fashion now.

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* Letter from H. Bergson, in the *Nation* (London, Jan. 4, 1913). Quoted by Sir Francis Younghusband in his beautiful book, *Life in the Stars.* In a still later statement, *Les Deux Sources de la Morale et de la Religion,* Bergson seems to advocate a theistic mysticism.

The theory which I have advocated is that of creation through interaction, under cosmic control. The analogy of reality to an organic whole is not new. It was advanced by Plato in a mythological fashion in the *Timaeus* and in a simpler and more dogmatic way in the tenth book of the *Laws*. It was stated by Aristotle in terms of a teleological hierarchy, which is also an astronomical hierarchy, in which God is the supreme and final cause. Aristotle's cosmological scheme was revived in scholasticism and formed the framework of Dante's *Divine Comedy,* but its astronomy has given place to the Copernican theory; and its rigid hierarchy of forms has melted into Darwin's origin of species. It does not meet the demands of the epoch of evolution. In modern idealism the essential wholeness of reality has indeed been emphasized. But the wholeness contemplated is that of an eternal, inclusive psychological ego. Modern idealism has been afflicted with psychologitis; and in spite of its great contribution to the interpretation of human institutions, it has failed to connect with the main current of modern thought. We cannot banish the galaxies of stars and their space-time relations by retreating within our own subjective world and declaring matter, time, and space to be mere appearances. No day-dreaming can undo the fact that we have emerged in the history of the earth, which in turn is part of the sun, which in turn is a member in one of multitudinous galaxies of stars. If we are to understand the meaning of our existence, we must understand it in terms of the whole of which we are a part. If the cosmos functions somehow as an organic whole, the guiding field must be as wide as the galaxies of stars, and it must explain the interrelation of the multitudinous cosmic histories, in one of which our life figures.

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An organic whole requires both a control—a genius of the whole—and interacting parts. We may use the hu-

man organism as a type. In the human organism we have a hierarchical organization of levels of control in which the lower levels are subject within limits to control by the higher. Through this control the parts of the organism are regulated so as to serve one another and the whole. This wholeness of the organism is made possible by the interaction of the parts under the guidance of the dominant control. This interaction is effected through two kinds of "messengers" or energy patterns —neural patterns and chemical patterns—which carry determining influences from part to part. That neural currents communicate patterns of behavior to the various parts of the organism has been known for some time. Chemical patterns are carried by the hormones, probably through the blood, to regulate the growth and stimulate the energies of the parts consistently with the life of the whole. But a human being is not merely a physiological organism. It is an organism endowed with mind. Its actions are in part meaningful or purposive, not merely mechanical. This means a whole-control by mind. The development of mind in turn involves a milieu of social relations—the interstimulation of individuals by means of language and other signs. The environment of mind is a social organism.

Within society there is an overlapping of generations so that the new generation may develop its life under the nurture of older generations. This is admirably provided for in the family. There is also the contact of various cultural groups with their varying advance and varying quality of culture. In human life, therefore, there is a level of spiritual control as well as various levels of organic control. And this spiritual control is made possible by the communication of energy patterns—determinate social influences to which the individual responds. The response, in the case of interaction on any level, depends not merely upon the character of the stimulus which is communicated but also upon the organization and plasticity of the responding individual. The re-

sponse is a synthesis of the communicated influence and the character of the responding individual. The control in society is exercised mostly through the consolidated structure of custom, which expresses the group's will to live, but there is also at a higher level, the individual evaluation of the social sanctions in the light of reason. The relation of the individual to society is not a closed control, but is open through reason to revision from a broader relation to the genius of the universe.

Now let us think of this vast starry world as analogous to a super-organism of some sort, with a dominant control and with the interrelation of parts by means of interaction. We cannot of course carry over the analogy of the organism literally. The universe may function as a whole under a guiding field without being integrated into a single organism. But in some sense the action of the parts must have reference to one another and to the whole in the vast cosmic drama. The interstimulation from part to part, within the cosmic whole, as within the physiological and the social organism, must be by means of energy patterns, carrying determinate influences from part to part. These determining influences have to do with all the levels—material, vital, mental, spiritual. So far as the universe functions as a whole it must be by such intercommunication. Every part must send out characteristic impulses to the other parts in space under the control of the whole; and no influence is really lost, though the motion at the receiving end is determined in part by the state of affairs at that end. Thus while the correspondence between various cosmic histories seems absolute on the level of atoms, the correspondence must become more generic and variant as the degrees of freedom increase. This we find illustrated in the more complex reactions on our earth and especially in human interactions. I am taking for granted that, when energy is communicated from part to part of the cosmos, it is not just energy in general that is communi-

cated—this is meaningless—but that characteristic or patterned energies are somehow communicated. The energies we are able to observe from other parts of the cosmos are specific types of material energy or of radiant energy. These types are communicated as energy patterns. Within the earth-field of communication we know that the communication of energy is always the communication of patterned energy whether in material or spiritual communication. This I have already shown to be the case in the human organism and in society. So in the cosmos spiritual patterns as well as material patterns must contribute to the steering of things in space-time.

We must get over the false notion that unless we are cognitively conscious of the communicated patterns they cannot be real. Neural messengers and chemical messengers do their work whether we know it or not. It is not long that we have known of neural messengers; and it is only within a few years that we have known of the existence of chemical messengers. Within the psychological realm, suggestion may operate all the more effectively when we are not attending to the stimulus. Moreover, since spiritual influences are energies, they must produce effects in the steering of matter even though there is no organization to respond to them in kind. The patterned impulse of sound has a characteristic effect on matter even though there be no one to understand its meaning. As it is by hearing good music that one becomes musical, so it is by responding to stimuli of higher levels that a lower level eventually becomes tuned to them. As it is through the influence of air waves that the organism is brought to construct an ear, by means of which we may respond by *hearing sound* instead of merely getting its electrical impact, so one part of the cosmos is stimulated to advance by the influence of other parts upon it, though it cannot become conscious of these influences in kind until the proper organization has been perfected for the

specific response. And even then we may not be intellectually conscious. For intellectual communication a common medium of signs is necessary.

All this may sound like poetry. But conceptions need not be less true because they are poetical. I challenge anyone to form a conception of the universe as an organic whole in any other manner than I have stated. Cosmic control there is, and it must operate through the interaction of parts. In the part of the world of which we know most, cosmic genius is mediated by the interaction of parts—in chemical synthesis, in the origin of a new individual, in the cultural development of individuals. I believe that this is the way in which development is mediated in the life histories of stars and of galaxies of stars. And here too, as in the earthly relations, the response is due to the character and initiative of the responding agent as well as to the stimulus.

The possibility of distant parts influencing one another has been made clearer to us through the quantum theory. The radiations sent out by means of matter over the ether are communicated as quanta or constant finite pulses of energy. They act as the same quanta over any distance, when there is no interference. The number of quanta depends upon the wave length, or rather constitutes the wave length. Each individual impulse, when it strikes matter elsewhere, exerts its original force. A particular impulse of soul may occur at a distance of a million light years, and yet exert its energy undiminished when it strikes matter in any stage of organization elsewhere. It has recently been discovered that living tissue sends out radiation and its wave length has been ascertained. This discovery furnishes a new possibility of accounting for the unity of the living organism. But such radiation does not stop with the limits of the living organism. It must be effective through the whole of space, sending its quanta everywhere to act upon matter as the conditions permit—the more intense radiations serving

as carriers of the less intense. And mind, the highest organization of living energy, must also send out its radiations through the whole of space to effect results in accordance with the readiness of the recipient—steering the energies of nature towards mental organization under the guidance of the genius of the whole. We have no idea of the penetrative character of mental radiations. We do know that the power of a mental impulse in social communication is not affected by the sense medium. If it passes the threshold of sense at all, it effects its characteristic results. Good news or bad news has its characteristic effect, though the sound be weak. We do not know the effect, upon our mood and attitude, of all the spiritual influences which we do not sense. With a new meaning we may say with Milton:

> Millions of spiritual creatures walk the earth
> Unseen, both when we wake and when we sleep.

Here lies the real power of the Weltgeist. In the curvature of cosmic space no influence is dissipated. The quality as well as the quantity of energy is conserved. This is what the law of conservation of energy means in the last analysis.

* * *

What is the nature of the whole-control? May it not be merely the automatic result of interaction? Of late, great emphasis has been placed upon the function of the ductless glands, especially the pituitary and thyroid glands, in regulating the growth, proportions and tone of the organism. It has been assumed that the secretions of these glands furnish a sufficient explanation. But the growth, proportion, and health of the organism cannot be merely the result of the automatic interstimulation from part to part within the organism. There must be a control by the whole which regulates the production of glands with their secretions and their rôle in the whole. Else how can the glands know how to grow, what amount

of secretion to send out and where to send it? We know that the control sometimes fails and then we have abnormalities. In the universe there must be a control which determines the size of the quantum of radiant energy, the charge of the electron, the organization of electrons into atoms, of atoms into molecules, of molecules into crystals and living things, and so on through all the levels of organization. The whole cosmic situation with its dominant pattern is a factor, though ordinarily a neglected factor, in every transaction. There must be the genius of the whole in all creative synthesis. In our attempt to comprehend nature this genius must be conceived as aesthetic genius, as well as mathematical. The history of science shows that the hypotheses which are most effective pragmatically in the prediction and control of nature are also the most beautiful, as Sommerfeld has well said. This genius of the whole can be best understood if we regard nature as permeated by creative spirit. For this control of the whole cannot be regarded as a function of matter, since matter owes its organization to this control.

The hypotheses of cosmic control and of compensatory interactions between the parts do not conflict, but on the contrary imply and supplement one another. We cannot account for the constituent elements of nature or their structure without assuming cosmic control, nor can we account for the behavior of nature without assuming a plurality of individuals with their mutual responsiveness. On the level of matter, it is the cosmic field which determines the constancy of the electric charge and also prescribes the levels at which an electron can appear. These levels are statable as integral numbers. But we cannot predict absolutely at what level the electron shall appear, though it must appear at one of the levels prescribed by the field. It is clear that there is both determinacy and indeterminacy in nature—a structural field which indicates the permissible routes of transformation

and also a certain indeterminacy of individual reaction. This duality of determinacy and indeterminacy holds throughout nature. There is a determinate pattern of relations according to which we must live, if we want to live healthfully and efficiently. But we need not obey this pattern even when we know it. We cannot say that nature is indeterministic microscopically (i.e., on the primary levels of nature) and deterministic macroscopically (i.e., on the complex levels of nature). This misconception has arisen from the fact that macroscopically we deal with nature by the method of statistical averages, as we do in insurance tables. But statistical averages are not norms of nature. They are merely conveniences for dealing with large numbers where we cannot follow the individual transactions.

We may think of the structure of the cosmos as a hierarchy of fields. We are familiar with such a hierarchy in the human organism. There are the fields of the lower centers of the nervous system; there are also the cerebral fields and the psychological fields. The cerebral fields give definiteness and organization to the lower neural fields, as we see in the difference between the precise and quantitative epicritic reactions, when the cerebrum is in control, and the indefinite all-or-none reactions when the cerebrum fails. The cerebrum with its habits in turn is controlled by dominant interests which give direction and purpose to our activity as contrasted with the chaotic reveries when psychological control is weak. In the cosmos we must suppose a far greater range of fields —electromagnetic fields, gravitational fields, chemical fields, organic fields, psychological fields, and, over and above them all, the supreme spiritual field which prescribes the architecture of all the subordinate fields, which in turn make their variant individual adjustments according to their own relativity. The measure and structure which we find in matter is not due to matter alone. Matter by itself would be as chaotic as the old mechanistic theories pictured it. But it is no longer pos-

sible to picture the material world as a world of chance. It is a work of genius. We must not, however, make the ridiculous mistake of looking for this genius in the amorphous background of nature, call it ether or what you like. The genius of nature must be sought in the activity which gives measure and organization to nature, not in its raw material. It is somehow akin to the spiritual activity which we know as creative genius in man but vastly nobler. The beauty of matter and the beauty of art are intimations of its activity, but it is beyond them —ever and everywhere present in activity and essence to create and to heal, but surpassing in quality all that is created.

In trying to picture the control and interrelatedness within the whole in the language of modern science, I have stressed perhaps unduly the analogies borrowed from the physical sciences. If the universe is controlled ultimately by a spiritual field, we must not think of interrelatedness within this field as merely mechanical communication from part to part in space and time. We must rather think of the interrelation as mutual adaptation and selection. In a living whole the target selects the appropriate stimulus, but also the stimulating energies select the appropriate target. They do not hit it by chance. If the cosmos is controlled by a spiritual field, such must be the interrelation even in the field of physical radiation. We know that such is the interrelation on the organic and psychological levels open to our investigation. The interactions within the organism and of the organism with the environment are determined by the unitary life of the organism in its self-maintenance. Energy is not communicated at random but in subservience to the genius of the organism as a whole. In the economy of the organism there is selection of relevant energies. There is suppression of the energies which do not fit into the dominance of the whole; the suppressed energies do not count in the integration unless they are trans-

formed into the control of the whole. Else there would be endless confusion.

Where the control becomes psychological this selective relation becomes even more obvious. The tendencies which are irrelevant or hostile to the dominant field of interest are suppressed unless they can be sublimated into the dominant pattern. This may be serious for the life of the individual, but it may be necessary for the life of society. If we think of the control of the cosmos as a spiritual field, we must think of this pervasive spiritual control as regulating the intercommunication in the cosmos for the maintenance and health of the life of the whole. We must suppose that the tendencies which are irrelevant or hostile to the spirit of the whole are inhibited or rather held by the gravitation of their own inertia in selfish isolation. They fail to seek integration within the spiritual field of the whole and thus cut themselves off from the life of the whole, to run their own tragic course of defeat and disintegration. Only what tends to upbuilding and health can have a part in the on-going spiritual drama. Whatever there is of goodness, truth, and beauty in finite striving becomes immanent in the spirit of the whole and goes on towards its own development and the development of life within the whole. Here lies the secret of salvation and immortality within the spiritual economy of the whole, where individual willingness is an essential condition, but where there must also be the abounding grace of the spirit of the whole. Within the unity of the spirit of the whole, effectiveness is no longer measured by distance in space and time. What is immanent in the spirit of the whole is immanent to all the parts that are in spiritual rapport. All the patterns of energy are immanent somehow in this spiritual field and have their characteristic effect in due season when the conditions are prepared.

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I realize the enormous strain which such a theory of cosmic interaction imposes upon our imagination. If we were limited to the old mechanical model of lumps of matter, traveling for millions of light years through cosmic space, effective interaction throughout the cosmos would be a wild dream. But the new physics has come to the aid of our thought if not to our imagination. Physics has been obliged to think of the elementary types of energy—radiation and matter—as having a particle aspect and a wave aspect. And this must hold for all the levels of energy, material and spiritual. In its particle aspect energy is indeed subject to spatial and temporal limitations. But in its wave aspect everything is present throughout all of space; it is part of a cosmic community which is immanent in the parts and which interpenetrates everywhere. In its structural aspect the cosmos is interlaced into one vast system of harmonics. This system—the genius of the whole—knows everything that *can* happen, whether in the present, the past, or the future. As participating in this community, we are indeed members of one another and of everything that exists or ever has existed or ever will exist. Nothing is indifferent to us. But in our capacity of particles or individual agents we act with uncertainty, we grope our way in the scheme. The orbits or levels in which we can act are indeed determined by the total scheme of which we are parts. But we must discover, through trial and error, in what organization we can reach harmony and fulness of life. It is so all through the stages of creation. Hence the tragedy of failure in the creative process. We must discover, through struggle and pain, our life in the whole, and inspired by the spirit of the whole, creatively incarnate the appropriate pattern into our lives so far as our limitations make it possible.

It is certain that if we are to glimpse the meaning of the cosmic drama, it must be from the hither side. It is through our creative adaptation to the structure of the

universe that we get some realization, however groping and imperfect, of the nature of the universe of which we are a part. For we are no foundlings in this universe, but the children of its genius. Through a long evolutionary process the vital impulse in us has responded, as its history, genius and willingness made it possible, to the call of the environment in which we live and move and have our being. It is not by chance that we have sense organs which respond to different energies in our world and enable us to adjust ourselves to them. These organs were prepared through long ages in the womb of nature through life's synthetic efforts to come into rapport with the urge of its environment. No mere cumulation of chance mutations in isolation from the environment could have made such an adaptation as the eye possible. And if we cannot understand such comparatively simple responses as those of the senses without the cooperation of the stream of life and the cosmos, how can we hope to understand the far more complicated adjustments of imagination and thought? For the birth of creative thought it was necessary that the genius of life should produce not only complicated organic milieus but also a social milieu in which thought could come to expression. Must we not regard thought as a response of the genius of life to the urge of Spirit in the universe? For when thought is born it is at home in the universe. It finds that its environment responds to thought. The Genius of nature conspires with the thinker to reveal its secrets. If we can appreciate and create beauty, it must be that the Genius of the universe has urged us on to build the proper structure to respond to beauty. And if we rise to mystic communion with the Spirit in nature, must it not be that by grace we have been oriented and prepared to respond to a spiritual world which is ever working in us and about us? For we are not something existing apart from the life of the whole, but this life is present in us and through us, though we must,

through our own willingness and the genius that is ours, make this life our own, so far as our limitations permit.

God is the spirit of the whole which, in the words of Clement of Alexandria, "gives spiritual tone to the universe." For moral and religious purposes we need a cosmic Presence which answers our spiritual craving for companionship and communion. This the aesthetic conception of Aristotle did not do and, therefore, it must be re-defined to meet the aching need of the human heart. The God we discover as cosmic control, as mathematical and aesthetic genius, is also a God to whom we can pray and whom we can worship. True prayer is an attunement of our finite life to the divine harmony. In this attunement lies our salvation. This harmony is love and goes out in infinite compassion to the finite struggling world to pardon and redeem our failures so far as we are willing. No other idea of God will serve. A universe which meets our intellectual demands shall not fail us in meeting our moral and religious demands. We must remember, however, that this organic conception of the universe places a momentous responsibility upon us for the influences we send out. If no atom can be set in motion without affecting the remotest part of the universe, shall not new impulses in the spiritual field have effect through all time and space? Even now, by sending out noble impulses I may help to save a soul somewhere in Orion—not to mention some one nearer.

However much the meaning of this life in the whole transcends my imagination, I am certain that in my noblest moments of devotion my soul lives in the spiritual field of the whole and participates in all that is immanent in that field—in the field of life and mind on the earth and in all the life and mind in the cosmos. All that work in the spirit are my comrades and coworkers, however distant they may be in space. As the electron is part of the harmonics of the physical field, so my mind is part of the harmonics of the spiritual

field; and it is the harmonics of the spiritual field which in the last analysis determine the harmonics of the physical field. So far as my willingness and insight make it possible, my life is interwoven with the web of the whole under the supreme Master Genius. If Tennyson's Ulysses could say, "I am a part of all that I have met," I can say, I am a part of all the struggling, suffering, victorious life of the cosmos. With my beloved teacher, Josiah Royce, I believe that I am a member of a universal spiritual community and that it is my vocation to participate creatively with the eternal Spirit of truth, goodness and beauty, in companionship with all spirits that create in like manner, to spiritualize this temporal world. And I take courage from the faith that, however confused and discordant the life of this world may seem, there is ever present, like a Pilgrim Chorus, the eternal harmony of the Spirit of the Whole; and the music of this in my soul—distant and faint though it often seems —is the inspiration to strive to bring more harmony into a chaotic world.

Chapter 4

THE UNIVERSE A LIVING WHOLE

For an approach to the modern problem of cosmology we must go back to the great founders of the mechanistic conception of science, Galileo, Descartes and Newton, especially Newton, the greatest of them all. These thinkers were no narrow specialists who separated their religion and philosophy from their science. They wrought in natural piety and envisaged their problem as a whole. They were whole-men, while most of their followers have been part-men. If they required "the concourse of God" to understand nature, they did not hesitate to introduce God into their science. This is especially true of Newton. It has been said that Newton's metaphysics was crude, in contrast to the amazing originality of his science. It is true that he was not a trained philosopher. But the Platonic tradition which he assimilated in the Cambridge of his day is nearer to the genius of science than the sophisticated philosophy which came after Newton. It was in this tradition that modern science was born; and the mechanistic conception derived its significance and credibility from its connection with this tradition.

For Newton the world is not intelligible without God, and therefore Newton does not hesitate to introduce God into his physics and astronomy. In the *General Scholium* which he added in the second edition of his *Principia,* he gives us his conception of God. The attributes which he enumerates of God—eternity, infinity, omnipotence and omniscience—are borrowed from mediaeval theology. But for Newton omnipresence has a physical as well as spiritual meaning. "He is omnipresent, not virtually only, but also substantially, for virtue cannot subsist without substance. In him are all things contained and moved; yet neither affects the other: God suffers

nothing from the motion of bodies; bodies find no resistance from the omnipresence of God. It is allowed by all that the Supreme God exists necessarily; and by the same necessity he exists always and everywhere. Whence also he is all similar, all eye, all ear, all brain, all arm, all power to perceive, to understand, and to act; but in a manner not at all human, in a manner not at all corporeal, in a manner utterly unknown to us." One wonders, then, how God can be defined in the scholastic manner. But Newton's real conception of God is more akin to the pre-Socratic naturalists than to scholastic theology. He talks the very language of Xenophanes. Newton did not, any more than Einstein, believe in action at a distance. Gravitation is for Newton a mathematical statement of fact, not an explanation. Gravity does not inhere in bodies but is a function of their dynamic relations. For Newton, as for Einstein, the movements of bodies—the orbits of the planets and the stars —are conditioned by space. But space is for Newton more than the empty abstraction it has become in modern science.

Why did Newton find it necessary to introduce God into science? There was the general aesthetic reason which appealed so strongly to Plato—the simplicity, the orderliness, the beauty which he discovered in nature, and which made him admire and revere nature. There were for Newton empirical reasons also. The mechanical laws of nature are neither sufficient to account for the origin of the world nor for its maintenance, "though being once formed it may continue by those laws for many ages." The fundamental characteristic of matter is inertia. For matter to move, motion must be communicated to it. "The *vis inertiae* is a passive principle by which bodies persist in their motion or rest, receive motion in proportion to the force impressing it, and resist as much as they are resisted. By this principle alone there never could have been any motion in the world.

Some other principle was necessary for putting bodies into motion; and now they are in motion, some other principle is necessary for conserving motion. For from the various composition of two motions, 'tis very certain that there is not always the same quantity of motion in the world." Motion, he shows, may be gained or lost. "But by reason of the tenacity of fluids, and attrition of their parts, and the weakness of elasticity in solids, motion is much more apt to be lost than got, and is always upon the decay."[13] We have abandoned Newton's force of inertia and now think of inertia as energy, but it appears true that motion is always upon the decay.

Newton practically states the conception of entropy. Compensation for the decay of motion, Newton thinks, may come from "ethereal spirits," but it is through God that ethereal spirits are condensed into matter and replenish the losses of motion. Here Newton foreshadows the idea that radiant energy may be converted into material energy. But for Newton this creation and regeneration takes place in the medium of God, "a powerful ever-living agent, who being in all places is more able by his will to move the bodies within this boundless uniform sensorium and thereby to form and reform the parts of the universe, than we are by our own will to move the parts of our own bodies. And yet we are not to consider the world as the body of God, or the several parts, as the parts of God."[14] The creative presence which formed the world out of ethereal spirits and guides and sustains the world cannot be identified with the world. While Newton, in conformity with tradition, thinks of the world as having a beginning, the cosmos might very well be eternal, since the presence of God insures its continuous re-creation. Newton suggests that in different parts of space God may vary his creation of matter, and therefore the laws of nature. It is clear that, to Newton's mind, nature is not mere dead sightless lumps, blindly colliding and aggregating or

separating in space, but that the world is permeated by creative spirit and owes its orderly existence and maintenance to this fact. This makes the world intelligible, beautiful and beneficent.

Leibniz ridiculed the idea that God should not be able to create a self-running machine at the start, but should need to tinker with it to maintain it. But Leibniz did not take account of the downward tendency of matter, "the decay of motion." In Leibniz' world there is no interaction, and therefore there could be no external loss. But Leibniz' conception of a pre-established harmony of clock-like monads, eternally wound up, has not proved useful in modern science. Later on, Laplace attempted a cosmology on Newtonian principles without God, but he did not take account of entropy.[15] Clerk Maxwell, the second greatest architect in modern science, saw the bearing of entropy and suggested that an "omniscient demon" who could work with the minute parts of nature might reverse the downward process by intelligent selection, but his omniscient demon is artificial beside the God of Newton. No doubt Newton was tempted to invoke the principle of God where the scientist of today prefers to profess ignorance. Newton, for example, was impressed with the fact that in any finite distribution of matter, be the number of systems ever so great, there must be a tendency for the outside systems to "descend towards the middlemost, so that the frame of things could not always subsist without the divine power to conserve it."* The scientist of today would be apt to remark, What of it? He is perfectly willing that the world should come to an end—a few billions of years from his day. What he forgets is that the question of the end is bound up with the question of the beginning, and a real scientist like Newton wants to understand the *whole.*

* At present the appearances are the opposite to those supposed by Newton. But the problem of entropy is the same.

Newton is a great metaphysician by virtue of the soundness of his intuitions. His metaphysic grows out of the needs of his science. You cannot separate God from the world which science investigates and have a satisfactory science. This aspect of Newton's philosophy has been too long neglected. Our sophisticated philosophers have told us that Kant undermined Newtonian philosophy by proving that space and time are ideal, i.e. in the mind, and that therefore extensiveness and duration cannot be said to characterize the real world. But all that Kant showed was that Newton's heuristic picture of an absolute Euclidean spatial and temporal order is supplied by our minds. Kant did not disprove the empirical extensiveness or empirical duration upon which Newton's science is really founded. These cannot be disproved by *a priori* arguments. Newton's faith, moreover, in an objectively controlled order and rhythm of nature remains as a challenge to the human mind. We cannot deduce this order *a priori,* but we must try to discover it if we can. Newton's insistence upon the necessity of a supra-mechanical principle in nature also remains. It is indicated by the insufficiency of any merely mechanical explanation of nature. Since it is founded on fact, it is untouched by the later scepticism. They say that Kant destroyed the arguments for the existence of God. But Kant merely destroyed certain *a priori* arguments for the fictitious abstraction of the unconditioned. Newton's conception of God as an extensive, enduring, omnipresent creative activity was an hypothesis of physics, and cannot be touched by *a priori* arguments. It made plausible for him his mechanistic science. In some sense physical science must always be mechanistic, but the mechanical conception cannot by itself be a sufficient explanation of the universe, as Newton clearly saw.

* * *

There is only one way in which we can conceive the cosmos as a going concern,[16] and that is by conceiving it

as in some sense dominated by life and mind, as Plato would say. Life is the only thing we know which can run energy up to higher levels of organization;* and the living organism is the only kind of thing which can curve energy within its own field so as to establish a reciprocal relation between the source of energy and its target. In the organism energy is not scattered at random with the possibility that some portion of it may hit something on the way and do appropriate work. That the relation could ever be appropriate is almost infinitely improbable on the theory of chance. The organism does not act as a mere accidental collection of parts with equally accidental relations, but acts as a whole, and the energies of the organism are directed in the service of the whole. Within the control of the whole the parts interact according to their characteristic patterns. It is not just quantity of energy that is communicated, but *patterned* energy. And characteristic work is done where such work is called for. In the case of a wound there is a rallying of a vast number of white corpuscles to the spot to repair the damage which has been caused. This is not a matter of chance. White corpuscles are not multiplied indiscriminately so that there may be a sufficient number at a certain spot, but the whole activity of the organism is concentrated at the dangerous spot.

How energy is transmitted in the organism is as obscure as in the case of radiant energy in cosmic space. We know that the activity of certain glands like the thyroid and para-thyroid glands is important in the metabolism and growth of the various parts of the organism, some of them far distant from the glands, but we do not know anything about the mechanism of transmission. In some way the action of the secretions is immanent in the organism and effective at the points where it is

* Since entropy involves the dissociation of the quanta of radiant energy or the increasing of the wavelength, thus diminishing the supply of available energy, the inverse process must be an integration of quanta or the shortening of the wavelength, whatever that may mean.

needed throughout the distribution of parts. In the organism, then, we have an instance, and the only instance, of a reciprocal relation over space between a source of energy and its target. We have the building and restoration of parts in the service of the whole. If we take the race as a unit instead of an individual organism, we have a similar process of building and restoration to keep the race going. The whole here becomes the life of the race instead of the life of the individual organism, but the principle is the same.

Now, suppose we conceive the cosmos to be acting as a living whole, with a variety of levels which must be adequate to account for the manifestations of which we are conscious within the cosmos, from matter to creative intelligence. When I speak of the universe as an organic whole, I do not mean that the universe is one biological organism. The great mass of it apparently is inorganic. I mean merely that there is in the universe a pervasive principle of life which guides towards maintenance and restitution in the large as the control by the organism does in the small. We must conceive the cosmos as somehow endowed with life and soul, and not merely as scattered masses of matter. To conceive the cosmos as an organic whole does not mean that we must conceive every part as an organic whole. That would be the fallacy of division. Within organisms which we know there are ingredients and transformations which must be described in physical and chemical terms. They contribute to the life of the organism within the control of the whole, but they are not organic. Obviously, if we conceive the cosmos as an organic whole, it can have no external relations, since there is nothing external to the cosmos. The relations therefore must be internal relations—the relation from part to part within the control of the whole. The cosmic field of energy is a closed field. In the cosmic organic whole, no energy is dissipated into outside space as is the case with the

limited organisms which we observe. These obey a finite rhythm and are only self-maintaining for a brief cycle.

We may regard radiant energy as the life blood of the cosmos. It all circulates within the control of the whole. We cannot at present follow this circulation in the transition from matter to radiation and from radiation back to matter. Sir James Jeans thinks matter must be transformed into radiation to keep the stars going, and Millikan thinks that the cosmic rays are evidence of the integration of matter. We are in the position of Harvey when he tried to follow the circulation of the blood in the lungs from veins to arteries. His magnifying glass was too weak to reveal the minute capillaries through which the exchange takes place. But he was sure that the exchange must take place, since if it did not take place life could not be maintained. And we are sure that the exchange takes place in the cosmic circulation, because otherwise the universe could not keep running. Within this whole there is patterned interstimulation from part to part and compensatory changes between the parts. We may state this relation as a relation of equilibrium, but it is an equilibruim controlled by a living system with its hierarchy of levels, not a mechanical equilibrium. The inter-relation is not external and fortuitous. The parts do not send out energy at random to be intercepted as it may. The inter-relation, on the contrary, is immanent in the whole, and the compensations take place under the control of the whole. There is surely nothing contradictory in conceiving the cosmos as a whole and also conceiving its maintenance through the interaction of parts except to minds that are so narrow that ideas must travel in single file.

In this inter-relation the parts have their say. They are not mere functions of the whole. We know of varying degrees of freedom as between the parts of wholes open to our observation. The degrees of freedom in atoms are different from those in molecules, different in

molecules from those in molar masses, different in inorganic masses from living things, different in the unicellular organism from that of the multicellular organism, different in an organism endowed with mind from one in which there is no such endowment, and different within the isolated person from persons in society. The degrees of freedom in the cosmic whole must present still greater ranges. As the human organism is not just one history, but a vast number of histories, atomic histories, molecular histories, cell histories, molar histories (such as that of the heart), all running their course within the organic whole, so in the cosmos there are an indefinite number of histories running their course within the whole. But the degrees of freedom must be vastly greater in the cosmic whole than in the economy of the human organism. In the cosmos we have not only a vast number of histories at various levels, but these histories, such as the history of the earth, are not truncated by being made instrumental to merely one cycle, as are the parts of the human organism, but are open towards the future, as human history is open towards the future. There is a large degree of pluralism in cosmic histories, each being the duration of its own past and open towards the future within the control of the whole.

In the inter-relation of these histories, we must take account of the willingness or inertia and the capacity or organization of the individual histories in their relationships. Even on the level of the atom the interrelations, the exchanges of energy, are not absolutely predetermined, but involve the individual willingness or inertia of the electrons. The structure of matter is, indeed, predetermined, and the levels of energy and possibilities of exchange are predetermined. But it is not predetermined that the individual electron shall appear at a certain level in the transactions. This is uncertain so far as the individual electron is concerned. The apparent certainty comes from the large numbers

usually involved in the transactions which make it possible to use methods of statistical averages, as we do in dealing with large groups of human beings, though we have been prone to regard statistical averages as legislating to the individual. From this illusion physics has saved us. In the inter-relation of parts in the cosmos we must therefore take account of individual variants as well as of cosmic control. The individual has a say in the comedies and tragedies enacted in the cosmos, whether the individuals be electrons or human beings or stars. What we can postulate is that, in general, the cosmic control directs towards the building and restoration of parts within the cosmic whole, and that individual structures cannot persist indefinitely except as they lend themselves to this constructive, healing process, since they cannot live within the whole without cooperating with the whole.

* * *

It is evident that only by conceiving the universe as guided by life and mind can we account for its being a going concern. But how can we conceive of the cosmos as an organic whole? No doubt our imagination is helpless in this matter. But if we must conceive the universe as an organic whole in order to account for the facts of experience, then it must be such a whole, even though we cannot imagine what sort of whole it is. The "indifference of space" will doubtless seem an insuperable obstacle to such a conception. But suppose we place ourselves at the level of electrons; and there are organisms which, at any rate, are very near the level of electrons in magnitude. To such an individual the wholeness of an organism like the human must be as unimaginable as a cosmic whole is to us. According to J. B. S. Haldane, the human organism stands midway in magnitude between an electron and a star. The "indifference of space" can then present for us no greater relative ob-

stacle to conceive the cosmos as an organic whole than it would present to an organism of the order of electrons to conceive itself as a part of an organism of the order of a human being. But impossible as it would be for an electron to imagine how the human organism could be a whole, we who are such wholes and are familiar with their integral functioning take them as a matter of course. The "indifference of space" which inspired such terror in Pascal is, at any rate, no greater when we try to relate humanity to the cosmos than it is when we try to relate the smallest constituents of our own life to ourselves.

We are familiar with more comprehensive wholes, such as social groups, which, through their inter-subjective relations, function more or less perfectly for a common purpose, and we are familiar with the division of labour and the integration of such division within social groups. It is not perhaps too much to expect that humanity eventually may become one social group with definite and characteristic divisions of labour and with healthful and intelligent integration into a whole. The spiritual continuities which bind human beings together over great distances must be taken into account as well as the continuities with which physics makes us acquainted. Since the reality of social continuity is the only one which we know first hand, it ill behooves us to discredit this in favour of other continuities of which we have only indirect knowledge.

And what about the "indifference of space"? Is space indifferent? May not space bind as well as separate? Is not the emptiness of space a mere convention due to the contrast of space with matter? We seem to be finding out interesting properties of space which make it far from being an empty nothing. To Leucippus, who (following Parmenides) gave the name "being" to matter, space became "non-being," though he asserted, at any rate, that non-being is as real as being. To us matter

does not exhaust the conception of being; it is only one of many types of reality. What we ordinarily think of as space is a mere negation. It is no thing in the sense of not matter. If we think of the cosmos as a living whole, what we call empty space may be the soul of the whole—all-pervasive spirit in which the transmitted patterns of energy are immanent and directed to their proper target. At any rate, to one who conceives the cosmos as a living whole space has lost its terror.

It was with great delight that I discovered that in giving this intimate and positive meaning to space I had the support of the great Newton and of Henry More, the Cambridge Platonist, to whom Newton probably owed this inspiration.[17] Henry More identifies space with the pervasive and enveloping presence of God. We have seen how Newton brought this conception into physics. More includes space in God rather than God in space, i.e. God is vastly more than what physics and astronomy deal with as space. "That spiritual object, which we call space, is only a weak passing shadow, which represents for us, in the weak light of our intellect, the true and universal nature of the continuous divine presence, till we are able to perceive it directly with open eyes and at a nearer distance." The shadow, however, is due to our representation. Space is really the divine presence. "I have clearly shown that this infinite extension which commonly is held to be mere space is in truth a certain substance, and that it is incorporeal or a spirit. . . . This immense *locus internus* or space, really distinct from matter, which we conceive in our understanding, is . . . a certain rather confused and vague representation of the divine essence or essential presence, in so far as it is distinguished from his life and activities, for none of the attributes which we have been recounting appear to concern the divine life and activity, but simply his bare essence and existence."[18]

More enumerates some twenty attributes which can

be applied to both space and God—"one, immobile, eternal, independent, existing by itself, subsisting through itself, incorruptible, necessary, immense, uncreated, uncircumscribed, incomprehensible, omnipresent, incorporeal, permeating and embracing all things, essential being, actual being, pure actuality." According to More (as later to Kant), we can think away everything in space, but we cannot think away space. More is trying to show that what we conceive as space is really an abstraction from God. But God is what we call space, and more, viz., life and activity. We and everything else live and move in the medium of God. Space becomes a friendly presence, instead of the thing that filled Pascal with fear. The thought of God filling the vast spaces exhilarates me. O my life! breathe deeply for the universe is full of God; and God is health, strength and beauty. Newton shows that this divine sensorium also fills the requirements of physical translation: "God suffers nothing from the motion of bodies, bodies find no resistance from the omnipresence of God." For Newton it means omnipresent genius and activity. It makes the world a going concern.

* * *

Another approach to the conception of a cosmic whole is afforded by the new conception of environment. It has been customary to separate the individual from the environment and to regard the environment as merely external and accidental to the individual. We have an extreme instance of such separation in Leibniz' conception of monads, where each monad is a self-sufficient and independent entity. Leibniz, however, feels obliged to bring them together by means of a pre-established harmony which nullifies their independence, since their existence, nature and inter-relations depend upon God. The old mechanistic conception of atoms makes them entirely independent as to their character and makes their

relations entirely external and contingent. An atom would be just the same if there were no environment so far as its own character is concerned. The new physics has thrown new light on the conception of environment. The electron is not merely an individual entity, though in some sense it seems to be an individual; it is also a wave or cosmic field extending through the whole of space. For we cannot possibly understand the electron if we take it as an abstract individual. The electrons, according to Weyl, form a group with respect to certain operations when certain definite conditions are satisfied. Schrödinger has pointed out, further, that the relations between these groups can be understood only by conceiving them as wholes. They have a pattern or *Gestalt* as groups.

According to Schrödinger, the difference between the new physics and the old mechanistic physics is that according to the latter the separate impulses, distributed over space and time, act by their sum, while according to the new concept they act according to certain wholes or *Gestalten.* This is evident in chemical action. The atoms and molecules, for example, have individual patterns of their own. They are wholes, and it is owing to this fact that they have their characteristic properties. They act as a group—not as a sum, but as wholes. In the field properties of classical physics there was a sort of whole (*Gestalt*), but it was due to the external conditions involved in the experiment. "The forms (*Gestalten*) with which we become acquainted in classical physics, as, for example, the characteristic vibrations of a membrane, the antennae field, a fluid oscillating in a vessel and similar instances have for two reasons subordinate importance. In the first place, they are essentially determined through formal conditions which quite clearly have an accidental character and for the most part derive from the objective of the experimenter in the just mentioned examples: the spherical, quadratic,

right-angled border of the membrane, the pattern of the antennae, the form of the vessel in which the fluid oscillates, etc. In the second place, in these classical instances the assumed field-function is regarded as a collective sum of the separate values. What happens and is observed is regarded as the expression of these. The postulating of characteristic oscillations is merely a mathematical convention, which can only incidentally gain a heightened physical or physiological interest, if there are in the fields still other structures, capable of sympathetic vibrations, whose behaviour interests us, for example a cortical organ or a definite radio receiver. In the hands of the quantum theory, on the other hand, the method opens to us the view of wholes (*Gestalten*) which for the understanding of matter have a much more intimate significance since in regard to the two above-mentioned points the opposite situation is brought to light. For in the first place the characteristic functions (*Eigenfunctionen*) of atoms and molecules are seen no longer to be dependent on incidental or conditional factors, but are determined by nature. In the second place, according to all appearances, the falling into determinate patterns (*Gestalten*) in nature concerns really just the essential structure of nature to which it is due. The characteristic functions are due to the immanent patterns which determine the observable occurrence.''[19]

According to the new physics, the structure or pattern is immanent in nature. The relations within the atom are not merely external and accidental, but they are due to the structure of the atom which is intrinsic or immanent in the atom itself and conditions the relations of atoms to one another in various compounds. The more complex structures like molecules and molar masses likewise have their immanent structures which determine their characteristic properties. Reality at the material level, then, is not a fortuitous combination of separate elements, but the individual includes the field.

There must, therefore, be a structure of the whole which prescribes the relations, as well as the character of the parts. We come back to the prophetic words of Plato: "There are measure and number everywhere." There is a control by the whole which prescribes the nature and relations of the parts. This is seen in the measure of the units of nature. The fundamental unit of energy is the quantum, the rhythmic measure according to which all exchanges of energy take place; and the unit of matter is the electron. There are two kinds of electrons, for ordinary purposes at least, the negative and positive electron or positron. The building bricks of nature are definitely measured, and the same everywhere (if we allow for the relativity effect). If, again, we consider the architecture of the material world, we find it is the same everywhere. The same atomic patterns reveal themselves throughout the cosmos when the conditions permit. The constitution of matter is universal. This can be understood only by postulating a cosmic control. It is infinitely improbable that the universality of the structure and functions of matter should be due to chance.

If we must postulate that matter has a universal field, or, more strictly, is a universal field, which determines the pulsations of matter and their architecture, so we must postulate for life a universal field. The old biology contrasted life with the environment and regarded the environment as something external and accidental to the living thing. In the light of the new physics we must postulate for life a universal field. There is not life *and* environment, but life is its environment. What we consider as the conditions of life are part of life. But the relation of life to its environment cannot be interpreted in terms of the physical sciences, as J. S. Haldane has so well pointed out.[20] It is a unique relation which must be understood on its own plane. We cannot understand the functioning of an organism if we regard the environment of life as accidental. Life does not stop with the

boundaries of the skin, but extends throughout the cosmos. A process such as breathing involves not merely the peculiar organization of the individual organism with its delicate inter-balance, but involves the whole field of the organism. The internal balance and fitness must be understood with reference to the cosmic whole. It is inconceivable that the fitness of the environment for life, considering the immensely complicated relations involved, should be the result of accident or the heaping up of accidents. It is truer to say that the cosmos breathes in the organism than to regard the relation of the organism to its field as merely external and accidental. The same may be said of the other important functions, such as nutrition. They involve a mutual fitness and inter-play of such a complicated character as can only be intelligible if we regard the field within which the organism lives as itself a living whole.

What is said of the maintenance of the individual organism must also be said of the maintenance of the life of the race. The continuity of the life of the race cannot be understood apart from the environment. The characteristics manifested by racial life can be understood only if we think of it as a pulsating whole-process, realizing itself in a whole which ministers to and controls its course of development. We cannot partition the characteristics of life as belonging partly to heredity and partly to environment. This is a false bifurcation. The characteristics of life involve the whole field—a delicate equilibrium within a whole which is fit to maintain life. It is a well-known fact that variations in what we are accustomed to regard as the external environment affect the characteristics of the developing individual. But we may go further and say that the characteristics of the individual are as much a function of the environment as they are of the life-stream of heredity. Life manifests itself and develops in a whole which has reference to life. If matter with its patterns can be un-

derstood only within the control of the cosmic field, how ridiculous to suppose that, in the far more complicated matrix of life, nature falls back on chance. Even should we be able to synthesize in the laboratory simple living things, it would still be true that this is accomplished through the cosmic field. All that we can do, in any synthesis which we attempt artificially, is to set the conditions for nature. The real synthesis is accomplished by nature itself. We can imitate nature only to the extent that we are in rapport with nature.

In the realm of spirit, of creative intelligence, it is as true as on the level of matter and on the level of life that we cannot separate spirit from its environment. The field of mind is the cosmos. The relation of mind to its environment is not statable in terms of physics nor in terms of biology. It is a unique relation. Mind can only develop, maintain itself and create in a field of mind. It is a group-conditioned activity. Mind evolves and acts in a group of minds. We have no evidence of mind as existing otherwise. There must be a spiritual continuum as well as a physical continuum and a vital continuum. As a matter of fact, this spiritual continuum of mind with mind is the only continuum of which we have first-hand evidence. It is where we live as spiritual beings. We know this spiritual field intimately in our relations with our fellow-men, but thought is at home everywhere. It is not local in its significance. Because of this fact we can attempt to frame a science of the universe, to understand the constitution of the faintest visible star, to enjoy the beauty of the heavens as well as of our human works of art. In this spiritual field it is given to some, at any rate, to enter into communion with the spirit of the whole which is not far from any of us, but is in and through all of us.

We are not mere functions of the spirit of the whole, any more than an electron is a mere function of its relations within the atom. There is the factor of individual

willingness and individual capacity. But in the spiritual field the participation in the whole becomes true freedom. The health of the individual soul can be maintained only by its creative cooperation within the spiritual whole of which it is a part, though, of course, we may court disease and suicide by refusing to enter into rapport with the whole. The spirit of the whole does not prescribe to the individual finite spirit what it must do, though the viable structure of spiritual life (as well as the structure of matter) is prescribed by the structure of the whole. Throughout nature, from matter to spirit, the individual retains the power of initiative and choice; therefore, to paraphrase Plato, God is justified and the individual is responsible. We think and appreciate through a sharing of cosmic structure. Kant had a profound insight when he pointed out that without structure mind cannot discover structure. But he made a fatal mistake when he isolated the human mind from its field. The structure of mind is not something apart from cosmic structure; it is cosmic structure at a particular level of development. Cosmic spirit furnishes the inspiration towards creative activity. It also furnishes the structure according to which creative activity must be carried on in order to be significant.

* * *

We have spoken of three types of environment and the individuals' relations to these environments at the three levels of matter, life and spirit, but obviously we cannot understand these environments as existing in separate compartments. There must be a relation of interpenetration and control within them if there is a cosmic whole. If we view the relation genetically, for example, in the history of the earth, we can see that it is because of cosmic control that what we call matter develops towards life and makes life in our local history possible. It has been pointed out by J. L. Henderson that it is infinitely

improbable that the conditions necessary for life should occur by chance. Henderson's statistical survey is confined to the local conditions of the earth and its atmosphere. If we take into account the cosmic conditions as well, we can see the further bearings of the problem. Not only must the local conditions be such as are fit for life, but the cosmic conditions in the larger sense must be fit for life, urge towards life, and prepare the local conditions for life. We know more now about the cosmic energies that play upon our earth. If these energies, such as cosmic rays and various other rays, were of different intensity the existence of life would be impossible. Not only the local situation, but the whole cosmic situation must be such as to conspire towards the appearance of life. And this we can understand only if we think of the whole as itself dominated by life and mind and controlling the conditions of any particular history towards future development.

We cannot just assume a tendency to greater complexity in the universe as some of the materialists have felt obliged to do. Such a tendency towards not only greater complexity, but new levels and new qualities of reality, can be understood only if we conceive a controlling field which owns in some sense the advance of nature as part of its own constitution. In such a field the appearance of life as a new mode of maintenance and evolution is no longer a mystery. The progressive development of life towards greater richness, greater sensitivity and more adequate response can be understood only through the milieu in which life develops, though here, too, we have to take account of the individual factor with its willingness and capacity. The structure of the sea-anemone is not the structure of a human being. And it cannot respond to the environment as a human being. It must in the nature of things, lacking a structure for adjustment, be protopathic in its response. The hierarchy of epicritic levels of increasing integration of re-

sponse, and more adequate rapport with the environment, can only come with creative adaptation to the environment.

The conditions for creative intelligence are far more complicated than the conditions for mere vital existence. They involve the development of structures which can respond with a new temporal dimension in the way of cumulative experience and imaginative revival as well as the simpler orientations of sense, tropism and habit on lower levels of life. Creative intelligence also involves the development of linguistic mechanisms which can furnish the code of spiritual communication. Though language is not thought, thought cannot develop without language and the spiritual interstimulation which this makes possible. The evolution of life towards creative intelligence must involve a cosmic field which owns intelligence. When one considers the almost infinitely complex conditions which are necessary for intelligence, it is madness to suppose that it could be the work of chance. The spark of creative intelligence itself must be lit by the creative intelligence of the cosmos which furnishes the perennial inspiration for creative activity.

The spirit of the whole dominates the course of the cosmos. It dominates not by despotic power, but by constructive love. It gives tone to the whole. It persuades the finite so far as the finite permits—to use the language of Plato. It selects and encourages all finite initiative which is in the direction of health and beauty. But it suppresses and excludes from the divine life whatever there is of falsehood and perversion in the finite. Nothing can persist in the divine economy which is contrary to the health of the whole. The good, as Plato would say, legislates to the whole and determines survival within the whole. The individual soul which is induced to take on the divine pattern, which falls into step with the choral dance of the whole (to use a figure by Plotinus), becomes integrated into the eternal movement of value. The soul

which refuses to do so puts itself outside the divine order. It shuts itself up by its own choice in the outer darkness of its own selfishness and eliminates itself from the whole. This is hell now or hereafter. As in the human organism the highest level selects and integrates the impulses, which are relevant and helpful to the life of the individual, but excludes those which are irrelevant and confusing, so in the divine economy the finite impulses, which are congenial to the spirit of the whole, are selected and integrated into the spiritual whole, while those which are hostile are excluded. Unless there were selection and suppression by the divine field, there would be utter confusion from the chaotic influences from everywhere. But the sordid influences cannot be admitted into the enveloping cosmic spirit. The wicked impulses and thoughts are immured in their local habitation. They are bound by the gravitation of their own lust to their earthly abode. This idea seems to have been expressed by Shakespeare through the king in *Hamlet,* who essays to pray while remaining in his murderous lust:

> My words fly up, my thoughts remain below:
> Words without thoughts never to heaven go.

The character of the cosmic spirit, which furnishes the form of the whole throughout the evolution of nature, we cannot pretend to fathom. All we can say is that it must be adequate to account for the guidance of evolution throughout its possible span, to furnish the creative incentive towards this evolution and to conserve that which is of value for the whole. We must not suppose that this creative spirit of the whole is bound up with any particular body or bodies. It is the nature of creative intelligence to emancipate itself more and more from its material environment, and even its organic environment, and to make these instrumental in its creative work. Such emancipation in our finite existence is limited by the cycle of our organic life. But we need not suppose that the spirit of the whole is so limited. We may con-

ceive the spirit of the whole as completely emancipated from the instrumental conditions, though dominating them and furnishing the rationale of their development. We cannot hope to understand, but for those who are in rapport with the spirit of the whole it furnishes light, beauty, salvation. To live in such rapport is the eternity of spirit now and forever, whatever may be the temporal accidents of our finite existence.

Chapter 5

A DUALISTIC COSMOLOGY

The universe presents itself to man as the great Sphinx —ever patient of man's attempt to guess its secret, which is also man's secret. If our guesses are in the direction of truth, we prosper—not only by material success, but what is more important, by the health and enrichment of the spirit. If our guesses are in the wrong direction we fail to steer our life in the sea of change and are submerged. We must approach the great Sphinx in a spirit of humility if we would learn, remembering that our guesses are, at best, something like the truth. We cannot hope for demonstration. The only field where we have demonstration is formal logic; and there we deal merely with the meaning of words. When we deal with reality we must be content with the solution that is most probable under our limitations. This is especially true when we set out upon the great adventure of cosmology. Plato called his great poetic interpretation of nature a myth to contrast it with demonstration. But he held nevertheless that we must seek for the myth which is most probable. The cosmological myth must have its roots in the past. It must represent the urge of history —the whole striving of man to comprehend the mystery of the universe. But it must use whatever of evidence the present search for light can furnish, while its shoots of intuition and budding hope stretch into the indefinite future. Our poetic interpretation must not only make consistent and reasonable the appearances pieced together into fragmentary patterns by science, but it must satisfy all our fundamental human interests—our aesthetic and religious demands as well as our scientific demands, our sense of value as well as our sense of fact. We must with Wordsworth cultivate "that serene and

blessed mood" in which the affections, "felt in the blood and felt along the heart," lead us on, as well as our sense-perception, controlled by a technique of logic,

> While with an eye made quiet by the power
> Of harmony, and the deep power of joy,
> We see into the life of things.[21]

There are two great traditions in Western cosmology —the mechanical tradition and the aesthetic tradition. These go back to the beginnings of Western thought. Thales is the founder of mechanics. He based his philosophy upon the aspects of nature revealed by the hand. What can be touched is substantial. Pythagoras gave the first philosophic expression to the aesthetic tradition. He emphasized mathematical forms as revealed in the realm of the eye and the ear—geometry and harmony. Light limits and figures the background of unlimited darkness. Sound can be tamed through number into music. In the tradition that follows Pythagoras, substance comes to signify the meaning or form of things. The two traditions reach their climax in the fourth century B.C. Democritus erects the world of touch into a cosmology—an infinite variety of little solids which play upon each other at random and make worlds. Plato discovered spirit and projected the dualism of spirit and matter. Spirit is the agency which gives form, matter is the raw material which is to be induced to take on form. Spirit is more important, not in the sense that matter does not exist, but in the sense that matter has no value or meaning without spirit.

The upholders of the tradition of Democritus have always maintained the priority and universality of touch as a test of reality. But can you say that an amœba possesses a sense of touch? Can you touch light or sound? And for that matter can you touch an electron? With the emphasis on the sciences that have to do with radiation, the claim of touch to priority has declined. But the models derived from the sense of touch have shown a

stubborn persistence. There has been a feeling that touch is less anthropomorphic than the other senses and that by means of solids you can picture a world independent of human nature. But that merely shows an ignorance of physiology. The sense qualities, in terms of which we try to picture the world, are borrowed from the reactions of the human organism within its milieu. When we transfer them to the level of electrons and photons, with their actions and reactions, our sense aspects become mere symbols and may be misleading symbols if we transfer them literally. Throughout nature it holds that it is not by the senses but by the mind that we enter into the structure of nature, though the senses must furnish the evidence to check our imagination.

In order to compare the merits of the two traditions, we must go back to where we find them as pure as possible. The principles implied, moreover, must be consistent among themselves and adequate to account for the facts. It is not fair to smuggle in additional considerations borrowed from experience. Everything should be seen to follow from the original principles. We find the most consistent statement of mechanistic cosmology in Leucippus and Democritus. The solid substance of Parmenides is broken into random blocks which distribute themselves at random. The universe is playing a blind game of marbles. There is no principle of control except survival. An additional assumption, however, is borrowed from experience. Although there is supposed to be an infinite variety of atoms, they are all too small to be perceived. On the basis of chance, as Lucretius points out, some atoms might be indefinitely large. Lucretius goes on to assume that there is a finite variety of atoms —all too small to be sensed—, that things fall into classes, that there is a tendency in nature towards increased complexity whenever the conditions are favorable. But these assumptions are borrowed from experience and are obviously inconsistent with the original hypothesis that

this is a universe of chance, without any guidance whatsoever.

The founders of modern mechanics did not erect mechanics into a cosmology. On the contrary, they assumed a creator, a supra-mechanical principle, as the ultimate reality. Newton takes pains to point out that a mechanical world could not come into existence of itself nor run indefinitely by itself. It contains the seed of its own destruction, especially the constant "decay of motion"—which we call entropy. It remained for Laplace to construct a universe on strictly mechanical principles—without God. But he did not reckon with entropy. Recently, mechanistic cosmology has been called forth from Hades by the genius of Sir James Jeans[22] and decked in the livery of nebulae and stars. But it is plainly a ghost. It no longer carries the conviction of the eighteenth century. While Plato calls his poetic interpretation of the universe a myth, mechanistic cosmology gives itself the air and authority of science, but really it is more of a myth than the *Timaeus*. Both art and mechanism are analogies borrowed from human experience. But art is the deeper analogy.

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Modern mechanistic cosmologists assume as a background for the picture of cosmic evolution a primordial chaos in which matter is distributed uniformly throughout space. Projecting backwards from what he takes to be the present distribution of matter, Jeans pictures an initial condition where the molecules are uniformly spaced three yards apart, an enormous distance for molecules. Such a condition would give the maximum of potential energy. Of course it is infinitely improbable that such a condition should have happened by chance. Moreover such a condition being a perfect equilibrium, requires some initial disturbance. It is not self-starting. And if it cannot start it cannot go, and that should be

"the end on it." Jeans therefore makes another assumption—a breath of motion from somewhere disturbing the cosmic stillness. With these two assumptions Jeans thinks he can deduce the universe from Newtonian mechanics. The gravitational disturbance produces rotations which must be of the order of extra-galactic nebulae in order to cohere. The continuation of these rotations produces stars which preserve the angular momentum of the nebula; and the stars in turn may divide into binary stars which, in turn, preserve the angular momentum of the parent star. These separate farther and farther, partly because of tidal friction, partly because of loss of mass by radiation, and so decrease the gravitational pull, until their orbits eventually become parallactic. But the two original assumptions do not suffice. Jeans feels obliged to bring in another assumption to account for the orbits of binary stars—that of wandering stars which come into close proximity to the binaries. H. N. Russell has shown that binaries are far too numerous to be served in this fashion. Eddington estimates them as, at least, one-third of the total number of stars; and a large proportion must have passed beyond recognition. To account for the planets of our solar system, Jeans forsakes his initial assumptions, and (with Chamberlin) he now relies entirely on imaginary tramp stars. One is supposed to have come into close proximity with our sun and to have raised enormous tides. Out of the rotating filaments produced by these tides our planets are supposed to have originated, preserving in their revolutions their increased angular momentum. Of course this assumption carries in its train a host of subsidiary assumptions about the nature of the passing stars, their proximity and velocity. Still another assumption is required to account for the reduction of these orbits to the present form, namely a vast amount of floating matter which did not fall back into the sun. With these assumptions Jeans attempts to account for the

peculiar distribution of angular momentum in our solar system. The comets and some of the satellites require still other assumptions.

Such is the myth of mechanistic cosmology in the hands of one of the greatest mathematical astronomers at the present time. Jeans' myth, like Plato's, requires a demiurge in the hoary past. But the demiurge is outside the system and incongruous with it. The mechanistic explanation is not self-sufficient; and it lacks aesthetic appeal because the facts do not follow from the initial picture without bringing in additional assumptions. Tramp stars have been a favorite device when astronomers have been in difficulty. They have been used to account for variable stars and also of novae, but here they have gone out of fashion. The astronomical imagination cannot conjure up enough of them to do the work. We have seen that they cannot account for the orbits of binary stars for the same reason. And there is no more reason to suppose that they account for planets, though here our present evidence limits us to one planetary system. The theory makes our earth and the life of man an incredible accident. But perhaps the difficulty lies in the mechanistic assumptions. Why assume that Newtonian mechanics can account for the details of our universe? Both the theory of relativity and quantum physics have shown that classical mechanics is limited in its application.

One wonders why the mutual tidal attraction of binary stars has not suggested to the mechanist a more credible way of accounting for the origin of planetary systems. The binary stars exist apparently at all sorts of distances—from the spectroscopic binaries to those which must have passed beyond recognition as binaries. In the separation of binaries (and also of multiple stars), there must be a favorable period for tidal attraction to assert itself in the separation of planets. If we combine with this suggestion that of Jeans that stars about to

divide and those that have recently divided are variable stars, in a very unstable state of internal equilibrium, we have a further possibility of accounting for the effectiveness of tidal attraction and also for differences in angular momentum within any one planetary system. Such a conception would make planetary evolution of one piece with stellar evolution as Kant and Laplace imagined. They probably are of one piece. The question is: What piece?

At present astronomical theory is in a state of transition.[23] No sooner had Jeans published the revised edition of his monumental cosmogony than new evidence from Mount Wilson Observatory, the result of the patient labor of Hubble and Humaston, threw the astronomers into confusion. The photographs show that the spectral lines in the light, which reaches us from the matter of the spiral nebulae, are displaced towards red and that the displacement is proportionate to the distance. If we interpret this as we usually interpret the so-called Doppler effect, it means that the universe is expanding with enormous velocity. This would upset completely the time-scale hitherto accepted for astronomical evolution. A comparatively short time ago as the astronomers count time—some tens of thousands of millions of years ago—the material universe must have been very much congested. We have a "fire-works" theory of evolution. In the light of the new evidence, Einstein has abandoned his model of a static finite universe. Abbé G. Lemaître, Friedmann, De Sitter and other mathematical astronomers have been busy constructing models of an expanding universe. Eddington has shown that the observed results are consistent with the calculated result from the wave-equation for an electron—the fundamental equation of modern quantum theory—and believes that the apparent motions of the nebulae are genuine. It has been suggested, however, that, instead of the universe expanding, energy and matter may be shrinking

and the shift towards red may indicate the loss of energy in the light transmitted. But the cause for this is unknown, and astronomers incline to the hypothesis of expansion as the simpler hypothesis. Richard Tolman has worked out a mathematical model for alternate expansion and contraction. We know of stars—the so-called novae—which alternately expand and contract; and Milne thinks every star may be a nova at some time of its existence. May not the same fire-works take place in the material universe at large?

Obviously our evidence is very limited since we can observe only a small part of the universe. At any rate we must not take too seriously the theories of origins which have been based upon the present distribution in the stellar universe. What becomes of Jeans' calculation that there has been only one chance in a hundred thousand of one passing star kissing another star—to leave behind a progeny of planets—if the universe was concentrated in one immense atom only thirteen thousand million years ago, as Lemaître estimates? Aside from the cosmic expansion, indicated by the red shift, Hubble's photographs of the spiral nebulae indicate expansion of these in their evolution. Moreover, F. H. Seares has warned us recently that the estimated distances in our own galaxy must be vastly exaggerated from the failure of astronomers to take account of the cosmic dust in our galaxy. If one allows for this, he thinks that the size of our galaxy is quite comparable to the sizes of the other spiral nebulae. The most promising aspect of the present situation in astronomy is that the old dogmatism has been broken through. Perhaps the correspondence, indicated by Eddington, between the phenomena on a cosmic scale and those of quantum physics may be the beginning of a less mechanistic astronomy. Mathematical form may some day supplant fortuitous mechanical interaction in the realm of astronomy as it already has done in atomic physics. But at present the beginning

and the end of astronomical evolution are equally in the dark. In wonderment,

> The astronomer's eye in a fine frenzy rolling,
> Doth glance from heaven to earth, from earth to heaven,
> And as imagination bodies forth
> The forms of things unknown, the astronomer's pen
> Turns them to shapes, and gives to airy nothing
> A local habitation and a name.[24]

The mechanical theory of the universe extends the second law of thermodynamics or entropy into a cosmic law. Entropy is the *bête noir* of mechanistic cosmology. Entropy signifies that in all the transactions of nature there is a loss of available energy; and since this loss is finite all the available energy must eventually disappear. According to Jeans the energy of the stars is largely the result of the breaking down of matter until matter shall have spent itself in radiation. This radiant energy is all the while being dissipated into space, where it rarely encounters matter and, therefore, the greater portion of it is in effect really lost. Even that which encounters matter merely hastens the doom of that matter which, in turn, must be dissipated into radiant energy and lost into empty space. The world is a finite affair so far as its future is concerned—a matter of some billions of years. It must also be finite so far as its past is concerned—a matter of some billions of years. The existent world must have originated by some unknown magic. Jeans recognizes the break-down of the mechanistic hypothesis, but he makes no serious attempt to supplement it. He suggests that it may have been "the finger of God" which started things. But I do not believe that God runs a game of chance. Elsewhere Jeans tells us that matter seems to stream into the spiral nebulae from some unknown dimension of space. But this is mere obscurantism. Again, he falls back on a romantic philosophy which makes the cosmos an unreal show with the human mind as the magician. What is clear is that a mechanistic hypothesis, moulded upon inorganic matter, cannot be a

sufficient explanation of the universe. The whole thing hangs dizzily in the air without rational support. It is true that the period allowed for cosmic evolution is enormous compared to our human lives. But this should not blind us to the futility of the whole thing. The mechanistic hypothesis, if taken as a philosophy, lands us in intellectual bankruptcy. It requires a miracle in order to start the world and holds out no promise for the future except universal death.

It is true that even from the point of view of physics, Jeans over-simplifies the problem in using nothing except Newtonian gravitation to explain evolution in the universe. We shall need to know more about matter and its relation to radiant energy and the relation of both to relativity. But I do not think that such further refinements will essentially alter the predicament of a mechanistic cosmology. Einstein's theory of gravitation is as mechanistic as Newton's. The curvature of space depends ultimately upon the fortuitous distribution of matter in space. So long as we try to explain evolution in terms of the inorganic, there is no escape from entropy. If entropy were merely a statistical result—the mere shuffling of a pack of cards—we might hold with Lucretius and Boltzmann that any state of things may happen in infinite time. The present, it is admitted, is a very improbable condition of the universe and would rarely occur. But entropy is not merely a statistical view of nature. It is empirically and experimentally founded. We know of no exception to it in the physical world. It was supposed at one time that it holds only in the gross world of macroscopic physics and that there is complete reversibility in microscopic physics. But it has been experimentally proved by Arthur Compton and others that wherever there are encounters between radiations, such as X-rays, and electrons, the laws of conservation of energy and of entropy hold. This has been shown for individual, as well as mass encounters. After an encounter

the radiation shows a longer wave length,* i.e., less energy, fewer quanta, while the electron shows a corresponding increase in velocity. There must, therefore, be a continuous degradation of radiant energy upon which all other energy depends. The futile oscillations of the Brownian movement foreshadow the final state of affairs on mechanical principles. But can we extend entropy into a cosmic law?

The application of entropy to radiant energy has been challenged by G. N. Lewis.[25] He suggests that radiant energy does not scatter into space in the random manner supposed by the mechanistic hypothesis. According to Lewis, radiation is always directed to a target. He supposes that radiant energy is only given out with reference to a demand, though the target be thousands of light years removed in time and space. Lewis' suggestion that our eye is in "virtual contact" with the distant star which it beholds does not seem intelligible in spite of his use of non-Euclidean geometry. Distance figures too importantly in our equations to be gotten rid of by a sleight of hand. It is true, however, that the transmission of radiation remains a mystery. It seems clear from the Michelson experiment that light does not travel in the ordinary macroscopic sense, for traveling with reference to light, whether in the same direction or in the opposite direction, seems to make no difference to the velocity of light.** We know it makes a difference to sound. We are accustomed to say that this is because light is electromagnetic waves and therefore different from air-waves. But this is merely stating the fact over

* It should be noted that all radiation has the same velocity whatever may be the wave-length. If light deviates towards red in passing through a gravitational field or after an encounter with matter, that does not mean that light is retarded in velocity but that it has lost energy. The velocity of radiant energy is a fact of cosmic adjustment and not dependent on local conditions.

** The real problem in the Michelson Experiment is the nature of the transmission of radiant energy. Einstein's special theory of relativity is merely a pragmatic convention—it works but it veils the real situation.

again, since the conception of electromagnetic waves is a symbolic statement of the difference. There must, of course, be shifts in space somehow to account for the effects which Michelson has measured so efficiently as the velocity of light. Lewis' suggestion is interesting, but there is no mechanistic way of explaining such a relation between the emission of energy and its target as Lewis postulates. We require for this a different cosmology from the mechanistic.

It is impossible to regard the mad orgy of chance in current celestial mechanics[26] as anything more than a confession of ignorance in dealing with such large scale events as stars and galaxies of stars. In the developments of the new physics we have abandoned the mechanics of fortuitous external relations. We have, on the contrary, come to regard the particular entities as existing in structural fields and as owing their character to these fields. The entities are measured by the structural field, and their transactions take place according to the patterns of the structural field. There is measure and number in the transactions of nature whatever indeterminacy there may be in the individual behavior of the small-scale constituents. If there is a cosmic field which regulates the units of matter and radiation and which prescribes the patterns of interaction for atoms, molecules, crystals and living things, can we believe that the large scale events of nature, such as stars and galaxies, obey no immanent cosmic control but happen merely by mechanical accident? Why should the stars run wild in the heavens any more than electrons, atoms and molecules in the fields which we can control and investigate?

* * *

The fact, which is beyond dispute, is that the cosmos is a going concern. We must conceive it as an eternally going concern or land in magic. The conservation of energy must mean somehow the conservation of levels of

energy, which means that there must be compensations between the parts, and this is only possible through control by the whole. It is evident that the mechanical conception of the universe, useful though it has been for a limited purpose, cannot be erected into a cosmology. A workable cosmological theory must be in some sense animistic. Only by conceiving the cosmos as guided by life and mind can we conceive it as a going concern. A living thing is the only kind of thing which can run energy up to a higher potential as well as down to a lower potential. In some sense the cosmos is a dynamic equilibrium, but it is a living equilibrium, not a mechanical equilibrium. In a living equilibrium there is mutual interaction of parts under the guidance of the whole. Energy is directed to a target. It is sent where it is called for and not merely scattered at random. In this sense the parts are in virtual contact in a living thing—not by spatial contact but by the control of the whole. Our old conceptions have been too particularistic and too externalistic. The individual and the environment have been conceived as having merely an accidental relation to one another. In our new conception the individual is part of its environment, and the environment is part of the individual. An individual, be it an electron, a biological organism or a personality, cannot exist without its field. And the ultimate field in every case is a cosmic field. Everything is what it is by adjustment to cosmic curvature (to use the language of Weyl). This implies a field or structure, but it also implies individual determination, and this is an independent variant. Else there were no adjustment—no comedy or tragedy. In a living whole the field must be forward-looking: it must be a teleological field, having reference to the future history of the parts and their relation to one another and the whole. Finally this conception of a living whole must be adequate to account for all the types and levels of adjustment which we must recognize in our experience.

My cosmology is built upon the conception of the cosmos as a going and self-regulating whole. The mechanistic conception of the universe cannot give us a self-consistent cosmology because it must in its regress assume at a finite time a non-mechanical factor to account for the origin of the state of affairs which it assumes. Nor can the universe be a self-maintaining whole on mechanical principles. The fact of entropy prevents that. Nor can the mechanical conception account for the measure and structure which we find. It can not account for the measured units of energy in nature nor for the observed universality of material structure. If we must assume a non-mechanical factor, why not include this in our conception as somehow immanent in the cosmos, instead of introducing it as a *deus ex machina* when our mechanical account fails? If we require a creative genius to start the universe, why not assume that this creative genius is eternally involved in the nature of the cosmos? In that case we do not need to postulate a miracle in some finite past—some billions of years ago.

The marvelous photographs of Hubble show that extra-galactic nebulae exist at all stages of integration from the globular nebulae, without any apparent differentiation, to our own starry galactic system. Jeans' statement that matter seems to be streaming into the extra-galactic nebulae from some unknown dimension of space is a veiled way of saying that matter is being formed. We cannot escape the conclusion that the creation of worlds is a continuous process. Millikan thinks that the "cosmic rays" are the result of atomic synthesis in extra-galactic space. Inasmuch as the atoms must lose mass in their formation, there must be emission of radiation. The weight of the other atoms is not a mere multiple of the hydrogen atom from which they must have been formed, but less. Hence, there must have been loss of energy by radiation; and Einstein has calculated the amount in various formations. Whether the so-called cos-

mic rays are the result of the synthesis of atoms is a question for science. Millikan has provided no principle of synthesis. On mechanical principles enormous energy would be required for such synthesis, and this would mean further entropy.* Somewhere we come face to face with a non-mechanical principle if the cosmos is to be a going concern. Such a spiritual principle enables us to account for the structure of nature—its aesthetic quality, its measure and number.

We must, with Plato, recognize two fundamental principles in the cosmos—spirit and matter. We cannot venture to say what matter ultimately is. We think of matter as electrons and protons. But these in turn may have to be reduced to radiations. This we must leave to science. But for us, as for Plato, matter is something to be organized into patterns—something indeterminate and primitive which is to a certain extent induced to take on form. The form is eternal. It gives measure and structure to a world of flux, however unpredictable this may be in its individual reactions on the primary level of nature. It is spirit which gives form and makes our world amenable to intelligence. But we must not conceive spirit as a realm of abstract stereotyped forms. We cannot conceive form as existing without life and mind, as Plato truly saw. Spirit creates form according as matter in its various conditions lends itself to form. The artist does not start with a set of ready made forms which he brings to bear upon an external matter, but he creates the suitable forms in the shaping of matter and of the particular type of matter—marble, tones, words. In this sense form and matter are concreated as St. Augustine believed. We can, it is true, abstract the general char-

* Reports from various laboratories indicate that science has at length been successful not only in disintegrating atoms but by bombardment of matter with radiation to convert radiation into mass and thus generate atoms of higher number in the scale. This indicates that there is going on a synthesis of matter in the cosmos. But entropy still figures, as enormous energy is required for such synthesis.

acteristics of form from the forms realized in the concrete creative process, as we can abstract the general properties of matter from this formative process, but the abstractions get their reality and significance from the creative process. They do not exist as abstractions. These are after-thoughts. We know the genius of nature only in the formative processes. The genius of nature in the large, as in art, creates the suitable forms in the re-creation of matter. The genius of nature works freely and spontaneously to realize itself in matter so far as matter in its wilfulness permits. This we know intimately in the formative realization of our own personality; and this for us, as for Plato, must be the key to the universe. Form is eternal, not in the sense that it is stereotyped and pre-existent to process, but in the sense that it is eternally significant when it shines through the passing moments. The creative process in the whole, as in us, must be regarded as intimate, spontaneous and personal.

We cannot just assume that things fall into series with ever increasing complexity of organization, for we must account for the organization. This cannot be done on mechanical principles. Organization is the spiritualization of matter, endowing it with value and meaning, subliming it (as Milton would say) into nobler form, until it becomes "a thing of beauty" and "a joy forever." It is not in the slime at the bottom but in the progressive realization of form that we must look for spirit. Without spirit matter would be amorphous, having no units or order except by accident. In a world in which spirit works, matter is never completely amorphous. Plato and *Genesis* picture an initial condition in which spirit hovered over absolute chaos without form. But this is dramatization. Matter is ever and everywhere controlled by spirit in our world. Even on the most primitive level of matter, there is "measure and number." The solid bulk of matter may dissolve into the uncertain electrons and protons and these in turn into radiation, "leaving

not a rack behind," but these are measured and obey numerical ratios in their tranactions. The whole material world is immersed in spirit like an enveloping sea.

Spirit and matter have complementary properties. Matter is characterized by inertia, spirit by spontaneity; matter by entropy, spirit by creativeness. Matter is ever losing potential. Life and mind increase potential. The law of spiritual activity is the inverse of material activity. For matter, activity means loss of energy; for spirit, activity means gain. We do not become poorer by communicating our spiritual energy but richer. Material activity means dissociation of energy. All material activity is bought by the using up of quanta of energy. Light is degraded to a longer wave length by the loss of quanta of energy when it acts upon matter. Matter in acting upon matter loses in velocity, i.e., in quanta of motion. Spirit, on the other hand, is synthetic. Through its alchemy it organizes the units of energy into greater complexity of pattern and greater potentiality for action. The ultimate units of energy are constant. What is required is a principle of synthesis. Spiritual activity is constructive, restorative, and healing; material activity is disintegrative and tends to the lowest level of diffusion, a "heat death." Matter and spirit are thus complementary in the drama of nature. We have no reason to despise matter and entropy for these furnish the instrument of spiritual construction. If matter had no downward course, spirit could not build up its marvelous structures. Matter furnishes the body, spirit the soul of things. But it is soul which furnishes the end, the value of the process. Without spirit there would be no form, no worth.

* * *

The conception of the universe as an aesthetic process of realization furnishes great advantages over the mechanistic conception. In the first place, the aesthetic con-

ception overlaps. It can take account of the mechanistic conception as a limit. The mechanistic conception shows what the universe would be without spiritual control—without God, as Plato would say. It helps us also to understand the limitations of the teleological conception. There is always the inertia, the indeterminateness, to overcome. This is true not merely on the lowest level of nature—the bringing of the elements of nature together into the primary level of structure. But this inertia or wilfulness exists at every level. Every level is matter for further reconstruction, as Aristotle has shown. To produce a synthesis of a higher pattern it is necessary to overcome the inertia of the *status quo*. And nature shows that this can be done only in part. Many are called but few are chosen—lend themselves to advance, are venturesome, at any level of nature. If it were not so, all nature would be at its highest level. But the higher the level, the smaller the proportion of participants.

The aesthetic conception enables us to account for form in nature—for nature falling into definite patterns (*Gestalten*) which are immanent in nature (and not due merely to external accidents, including experimental conditions), such as the forms of the atoms as they reveal themselves in their chemical reactions. The aesthetic conception, moreover, enables us, not merely to account for form, but the scale of forms, and the prospective adaptation which such a scale of increasing complexity indicates in nature. The mechanist's conception, from Lucretius down, assumes a tendency in nature to increasing complexity when the conditions are favorable. But it furnishes no rationale of such a tendency, no control through which the conditions could ever be favorable for such progression in complexity, amidst the accidents of nature. The principle of natural selection is a negative principle, not a constructive principle. But if there is a whole-control, working towards greater richness of reality, we can see how such a tendency in nature can be ef-

fective. In any case we must assume such a whole-control to account for the units of energy and the scale and uniformity of the patterns of energy within the world of our observation. This control must be in the nature of an aesthetic control, for it makes possible aesthetic comprehension and admiration even in contemplating the lowest levels of organization. We know aesthetic activity first-hand only in the realm of spiritual creativeness. It is for us, therefore, most reasonable to believe that the genius of nature works as an artist; that the artistic creativeness of man is the outcome of this activity; and that our insight into nature is made possible by the creative empathy or sympathy between the creative mind of man and the creative mind in the universe. The conditions, which bring about the emergence and effectiveness of the human mind, must be the outcome of intelligent control, for it is infinitely improbable that all the conditions required for human art should be the outcome of chance. It is only by viewing the universe as the field of creative spirit that we can understand the cooperation of nature towards the development of creative spirit.

Such a conception of nature enables us to glimpse the meaning of the rhythm of nature, its upward and downward path. Since life is the only thing which can run potentials upward, and living things are the only beings which can direct energy to its target, so as to bring about the up-building and restoration of parts within the service of the whole, a universe endowed with life and soul is the only type of universe which can combine the material tendency to decrease of potential with a compensatory tendency to increase of potential. If further we conceive the universe as not only permeated with soul, but with a soul of the highest intelligence, we have an intimation of the nature of the creative process which has brought about the creative intelligence of man. This could not have come about by nature's routine, be the routine of habit ever so complex. It is a qualitatively dif-

ferent activity in which the routine of habit and memory is traversed by new syntheses and which, in fact, guides the routine largely for the performance of the creative function.

In the creative intelligence of man and its instrumental use of routine we come nearest to divine intelligence, the pure activity in cosmic synthesis, though vastly removed from it, as our faltering steps too clearly indicate. Cosmic genius is capable of synthesizing the final units of material dissociation, the quanta of radiation, into greater and greater complexity of pattern. The ultimate units of energy are constant. It is their dissociation which constitutes entropy; and therefore their synthesis by a living intelligent agent furnishes the compensation to entropy. If the units were not constant, but degraded in the process, there could be no escape from entropy. Maxwell's demon may sort the faster from the slower molecules, but the sorting process must come to a stop with the equipartition of motion. The opposite process to entropy must be creative synthesis. While matter cannot exist as mere amorphous matter, in a world dominated by spirit, spirit can enjoy a life of pure creativeness, emancipated from matter, as we are privileged to a certain extent to do in our own highest creativeness, where matter becomes our instrument and not our master, though our freedom is limited and precarious in this mortal existence.

The aesthetic conception of cosmology is, I think, the most satisfactory for science. It also has the great advantage that it links science with the other great interests of the human spirit—the moral, aesthetic and religious interests. Man's spiritual activity, which furnishes him his highest end and satisfaction, is no longer looked upon as an accident in an irrational world of chance, but is seen as a reflex of the universe which brought him forth—a universe with a considerable admixture of chance and irrationality, since it is built out of individ-

uals with their own inertia and wilfulness, but which also reveals marvelous indications of pattern and beauty, which the human spirit in imaginative sympathy with cosmic spirit can tentatively re-create and thus, in a measure, comprehend. We must not assume that the universe can be reduced to pure reason, for we are part of the universe and there is much in us that is irrational and only partly integrated into form and purpose. But our mind, as intelligently creative, can adumbrate the large trend; and we can, in the limited part of the cosmos where we are effective, help to bring nature, especially human nature, into clearer pattern. This privilege and high vocation we share with the divine genius of nature which in its own wholeness and beauty vastly transcends us, but is immanent in its presence and in its activity for pattern and meaning in us and everywhere, so far as the finite permits.

* * *

No doubt this conception of the universe will seem anthropomorphic, and so it is. There is only one place where we get concrete insight into reality, and that is in our personal relations. Size is not the most important thing. The starry heavens may inspire a feeling of sublimity in *us,* but they do not inspire such a feeling in a jellyfish. Man constitutes an essential part of the sublime world. Love and friendship give us a more genuine insight into reality than a hundred-inch telescope. In love and friendship a drab world is lit up for a flickering moment with a celestial light. It is in these intimate personal relations that reality is revealed in its deepest meaning; and we require a cosmology which can furnish an adequate setting for this meaning and give adequate play to our deepest tendencies. The only part of reality with which we can hope to have intimate acquaintance is the part that is human or like the human. We cannot dehumanize knowledge and appreciation and have any-

thing of significance or value left. The observer is part of every significant perspective. We half create what we perceive.

Our knowledge is necessarily anthropomorphic, and therefore our cosmology must be anthropomorphic. The materials of our thought and the intellectual processes by which we manipulate them are human, all too human. Kant is right, and Protagoras before him, that man is the centre of his world—not man in general but individual man with his values and preferences, though, since man lives in groups with traditions, there is an averaging and accommodating of individual differences. Through a long process of evolution, biological and social, a certain similarity of human nature has been established which makes a degree of understanding possible, though there will always be a certain distance between human individuals, however intimate. But whatever similarities we may note, nature, as we take account of it, is created in the concrete situations in which we live as human organisms.

Nothing in nature exists apart from a context. The properties of things are created in the context. They are not copies of pre-existent contexts. And the character of our world is created in our human context, which is not the context of an angel or of a jellyfish. Our sense qualities, as well as our values, are the result of the functioning of our individual human nature in its particular environment. Both our human organization, physical and psychological, and the environment enter synthetically into the situation as we experience it. The world of our experience is reality in this milieu. The kind of world we have is determined by our structural qualifications and our history, as well as by the environment. We cannot separate the individual from his environment, as Kant tried to do, and hence wrongly pronounced our world as phenomenal because it is human. This human world is a real perspective of the world. We can say to

reality, "That art thou." We can also say, "That am I," because our experienced world is reality with the observer as part of it. This fact physics has only recently come to recognize. We are not separate from our environment. There is no "thing in itself" in the sense that reality does not reveal itself in this human world, though we have no right to say that the milieu in which we live is the only milieu in nature. There are an indefinite number of other milieus which we must infer in order to interpret the events of our experience of nature.

When we take account of nature in other milieus, our knowledge becomes problematic. Even the world of the dog must be vastly different from our world. It is impossible for us to say what the world is for a dog because our world is shot through with thought and language. The lower down we go, the more problematic the world becomes for us. We cannot imagine the inner life of an amœba, so we treat it as a thing. When we come to the microscopic world of physics—the actions and reactions of quanta of light and of matter—our imaginative sensuous models forsake us and we have to resort to the abstract models of mathematics. But mathematics after all is but language; and we have the authority of St. Paul that the gift of interpretation is superior to the gift of tongues. The scientist tries to give meaning to his language by telling us (and himself) that his entities behave sometimes as corpuscles and sometimes as waves. This is an attempt to make intelligible in terms of our human macroscopic experience how his entities behave. But the behavior of these microscopic entities is at best diffuse, uncertain and incomprehensible in terms of our large-scale experience. We are obliged to project mathematical models to understand the simpler levels of nature. But we do not thereby escape from human nature. The mathematical models are the creations by our mind and must be tested by our perceptions. Our knowledge must always be knowledge from our human perspectives.

There is no doubt a certain degree of continuity through the various levels of nature, as Leibniz believed. Nature is "not divided with a hatchet"—to use the language of Anaxagoras. Nature on the inorganic plane has characteristics which are life-like and perhaps even psychological. But we must not neglect the even more striking discontinuities of characteristics at different levels of organization, as Leibniz did. We must be careful not to be too anthropomorphic in attributing will and choice to electrons, though it is a distinct gain to have broken through the deadness of the old materialism.

We have been in the habit of thinking that the lower down we go in the scale of nature, the more definite and precise nature becomes. But that was a mistake due to our too anthropomorphic mechanical models. Our mechanical pictures are as anthropomorphic as our romantic interpretations. Definiteness and precision in nature are the result of organization. This we have found out in human pathology. The ordinary epicritic behavior, which takes account of locality, intensity and rhythm, gives way, when the cerebrum is incapacitated, to a protopathic all-or-none reaction. Today the physicist, after having discovered the diffuse indeterminacy of nature at its lowest level, is prone to reverse the interpretation and to assume that the same indeterminacy holds at higher levels, the difference being merely statistical. But this assumption disregards the effect of organization in canalizing energy. In chemical reactions we find a very high order of precision. The spontaneity which enters in at the level of human choice is due to a factor absent at lower levels—that of creative intelligence.

Kant's agnosticism has to do, not so much with the infra-human levels of reality, as with the supra-human levels. He is concerned to show that we cannot speak for God, as the Cartesians had assumed that they could do. If we cannot understand our own creative activity, how can we hope to comprehend God's creative activity and

the processes of his intelligence? This must remain problematic for us. This does not mean that we can have no intercourse with God, but that we invest God with the attributes which are most helpful to our human relations. These are relevant, so far as helpful, in our human relations. But we can say no more. This holds, contrary to Kant, for our moral relations as well as our other relations.

When I say that our human world is for us the real world, it may be objected that we often err and that error cannot be real. But I maintain that our errors and sins are real too. It is true that our judgments and attitudes are valid only when they prove relevant to the world as experienced. But they exist nevertheless as part of nature and condition our activity. Validity, in our human world, is at best relative, and *our* truth is a more or less successful approximation. Human errors are facts which we must meet. They vastly complicate our world, particularly the world of human relations. Our world is a pluralistic, partly indeterminate, world, in which we are creators and not merely spectators. There are conflicting viewpoints and attitudes with consequent comedies and tragedies. Hate unfortunately is as real as love. Our passions, for better or worse, enter into our judgments and further or distort our comprehension, more often the latter.

Science of late has tried to emancipate itself from the crass mechanical model of Democritus and to look upon its activity as fundamentally aesthetic, if not religious. This was the attitude of Poincaré, not to speak of the great Newton. This is the attitude of Einstein. Sommerfeld ventures the assertion that beauty should be put into the scales with experiment as of equal importance, for the hypotheses which have been the most successful in modern science have also been the most beautiful. This harks back to Plato who felt that the most beautiful was also the most suitable hypothesis of

nature. This conception of science gives science a genuine kinship with the other great strivings of the human soul—the artistic, moral and religious activities. It suggests Plato's interpretation that nature is divine art.

It is inevitable, however, that the scientist's preference should be for the impersonal form of beauty, since his procedure must necessarily be abstract. Einstein is quoted as saying that he prefers Bach and Mozart to Beethoven because Bach and Mozart express impersonal form, the form of the object, while Beethoven expresses the personal striving of man. For Einstein, as for Shelley, man is more important than men; the impersonal, than the personal. No doubt the large scientific generalizations seem impersonal, even though personally created; and in trying to create a new formula for human relations we must break through the inertia of the smaller unities with their personal passions before we can realize a larger personal freedom. But I must emphasize that reality, when we know it concretely and intimately, *is* personal, with its fugitive values and significances, with its—

> obstinate questionings
> Of sense and outward things,
> Fallings from us, vanishings;
> Blank misgivings of a creature
> Moving about in worlds not realized,
> High instincts before which our mortal nature
> Did tremble as a guilty thing surprised,[27]

in the immortal language of Wordsworth. The impersonal harmony is an abstraction and objectification of this personal striving, "with its broken lights." This personal life, with its comedy and tragedy, is the real life of human beings; and it seeks its realization in a personal life—infinitely transcending ours in quality yet intimately present to everything, evermore and everywhere immanent in its essence and activity throughout the entire scale of movements within the whole. This divine life is the complete expression of our ideals, but itself requires no models, for in the language of Plato,

it is the creator of all models, being itself the fairest and best and therefore striving to create the fairest possible.

* * *

You ask, perhaps, is it necessary to suppose that reality is fundamentally dualistic? If matter will not serve as a sufficient basis for cosmology, why is not spirit sufficient? There has been a strong tendency to monism in human thought. Monism has the appeal of simplicity. Scholastic theology assumes an almighty and omniscient God who creates the world outright—matter and form. Everything has its existence in God. But such an hypothesis runs amuck on the facts of indeterminateness and individuality which constitute the warp of our world. Its logical consequence is the inhuman doctrine of predestination. Monistic theology has always been in a dilemma. It has been obliged either to make God the deliberate author of evil, "and even with Paradise devise the snake," and so to deny the goodness of God; or to admit some sort of dualism or pluralism. The fact that it has introduced this through the back door, rather than as a frank admission at the outset, does not alter the problem. Anatole France has satirized the orthodox dogma by saying that "God was infinite before he created the world, ever since he has been finite." Philosophy must try to understand the world as it is. It cannot take refuge behind a dogmatic tradition. And in the world as it is, it must be evident to us, as it was to Plato, that ideals often fail of realization and are never perfectly realized. There is inertia or wilfulness to overcome, and the primitive, however tamed, is tugging at the leash, ready to fall back when the control is relaxed. There is no escape into a golden past, as the ancients were prone to think, or into a golden future as romanticists of today like to believe. If we are to create a cosmological myth we must try to create one that is most probable in the light of present evidence.

No monistic philosophy has succeeded in meeting the facts of experience. Hindu monism starts with the assumption that reality is one self, Brahm, with whom the enlightened become united in mystical experience. But all is not well with Brahm. A cloud passed over his pure vision and the world of process and multiplicity, born of ignorance and illusion, was created. It is from this illusion that man must be saved. This disease of the absolute must be timeless for the temporal world was born from it.

Modern idealistic philosophy, brushing aside the world of process as appearance, attempts to deduce everything from one spiritual being, variously conceived as a moral constitution, as an aesthetic unity, as a logical system, or as an anthropomorphic personality. But monistic idealism has never succeeded in giving a satisfactory play to individuality or in accounting for the maladjustments of the world as we find it. Hegel, who has made the most thoroughgoing attempt to construct an idealistic cosmology, starts with the dualism of the fall of the absolute—the ugly gulf of an absolute estranged from itself —and in working out his cosmology he sets over against the form-realizing principle a contingent, irrational world of mere mechanical relations. Much saner and more honest is the attitude of Hume and Kant who agree with Plato that teleology in the world as we know it points to an artist working with a more or less recalcitrant material. It does not point to a monistic God from whom everything proceeds with logical necessity. Recent science has made the analogy of the artist more convincing than it could be for Hume and Kant.

We must, like Plato, build out our philosophy from the world as we know it. And this world contains a great deal of plurality and indeterminacy in it. The dualism of creative spirit, working with a matter to be formed, fits in with the facts of experience. There is structure in reality, and this is the work of spirit, but there is also

plurality and indeterminacy. This dualism is evidenced throughout the scale of reality. It is manifest on the lowest level of nature. We cannot regard the ultimate entities of nature as merely mathematical functions. They have, it is true, a field-aspect or structure which furnishes guidance in their transactions, but they have also their indeterminate particular aspect. The behavior of electrons or photons cannot be individually predicted, though the levels and forms in which they appear are predetermined. Throughout the scale of nature, there is this dualism of predictable structure and a certain individual indeterminacy. The attempts to state the transactions in nature in terms of either pure form or pure chance have failed. The worth of behavior is due to the taking on of form, but the particular entity is privileged to take on a certain form or refuse to do so. This holds on all the levels. Mathematically the world would no doubt be more satisfactory if its behavior could be reduced to rational equations leaving no indeterminate surd; but morally and aesthetically it would lose its zest. In any case, cosmology should try to comprehend the world as we find it. We are not called upon as philosophers to create the world but to try to understand it.

What is the relation of the dualism of spirit and matter to the other great dualism—matter and space? The interest of science in the past has been primarily in matter and only secondarily in space. It has sufficed for mechanical science to define space in a negative way—as offering no resistance to matter. Space has been a mere emptiness in which matter could be spread out. The indications now are that space is likely to be an entity of great interest to science in the future. In the rhythm of emphasis it may become the primary interest. We recall that Newton felt obliged to attribute to space positive properties. He even identified space with spirit—the pervasive and constructive presence of God, which is pres-

ent in its own essence to matter everywhere, without including matter. Only so could he conceive the cosmos as a going concern. It would simplify our conception of reality if we could thus identify spirit with the enveloping continuum of space. I see no obstacle to identifying the spiritual field with space. Space is an empirical entity and we have a right to invest it with the properties which we require to make nature intelligible. But we must remember that a real being is more than a field. It must have its individual aspect. God, to be a creative artist and the Saviour of those who seek, must be more than an impersonal field. He must be in some sense personal as well as omnipresent. But how this can be, our limited minds cannot fathom.

* * *

The end of the story is that man must create a cosmos to furnish a setting for his own personal life—his venturous hope, his creative imagination—in poetic and religious sympathy with the reality that is about him and through him and in him. Science, by itself, can furnish only a symbolic skeleton of the world which man requires. The philosopher must breathe into the dead bones spirit of his spirit. Science cannot, by itself, discover the real secret of the universe. It peers into the deeps of matter and it is not there; into the far off nebulae but it is not there. Only when the method of science is illuminated with the intuitions of the heart can science help us toward discovering the real secret of nature. Spirit claims its immortal and inalienable right to create a universe which shall furnish it a proper environment for love and aspiration, for truth and beauty, and not merely for pragmatic needs.

Here I stand, washed hither by the mysterious tide of time, not in "utter nakedness" but "trailing clouds of glory"—of presentiments, of high demands. It is no answer to say that I have emerged from the past unless you

can show that this past could bring me forth. To do this, it must be more than the material and brutal past. It must stretch into the present and into the future. Man requires a Presence sufficient to furnish him a proper vocation—to love and to hope, to work and to weave dreams. Reality must be the great Companion which makes our striving possible, and meaningful. Man, the creator, looks for his meaning to a cosmos of creative genius, however child-like his efforts may be. This is the immortal vision of Plato—eternally true, though all his scientific facts are now fictions. Call this a myth, but it is infinitely more real than anything which mechanical science can give us. It is indeed the inspiration of all the greatest scientists. In devotion to this inspiration science becomes part, although an abstract and meagre part, of the poetry of life. Such a view of man's relation to the universe enlarges the frame of our imagination and admiration, as well as of our material control. And it keeps before the scientist the main theme, that science is for man—not the dethronement of man, but the increased vision, power and delight of man.

A brighter day is dawning when Sister Science, with poetry in her heart, shall serve the love of mankind through constructive spiritual vision, and not merely through the machine—no longer the murderer of the heart's desire, but its judicious hand-maid, in devoted response to "the deep music of the rolling world."[28] In the consciousness of the great Presence which suffuses all things, the scientist shall gain infinite inspiration for his voyage of discovery, the artist for his dream of beauty; and man shall win the peace that passeth understanding.

Chapter 6

MATTER, SPACE AND GOD

We can no longer regard the universe as the mere play of chance. The dice are loaded. Plato's poetic inspiration: "there are measure and number everywhere," has found striking confirmation in recent science. The units of matter are the same everywhere. So are the units of radiant energy. Not only are the units universal, but the structure of matter is universal. Matter everywhere falls into similar patterns when the conditions permit. The same elements which are familiar on our earth can be identified by the spectroscope in distant stars. These elements fall into a series of "atomic number" from one to ninety-two (and perhaps higher in the interior of stars). The atoms in turn are built into marvelous types of architecture—molecules, crystals, organisms. To Clerk Maxwell, molecules suggested the analogy of manufactured articles: "Each molecule therefore bears impressed upon it the stamp of a metric system as distinctly as does the meter in the archives at Paris or the double royal cubit of the temple of Karnac."[29] In the language of science today "it has been stated as a statistical truth that everything strives towards symmetry so far as the environment will allow."[30] If, again, we watch the transactions of energy, we find that these conform to number. This is manifest both in the chemical exchanges between atoms and in their physical relations to the cosmic environment. The levels of energy amongst which an electron shifts within an atom, in the absorption and radiation of energy, follow integral numbers or rather are integral numbers. It may be stated as physical fact that "God made the whole numbers and man made the fractions." We can also say that the facts indicate direction. Time enters into the structure of the world as

well as space. Why should the architecture of matter manifest a simple hierarchical order? And why should those elements which are essential for the building up of more complex structures, inorganic structures and living structures, be especially abundant in the course of nature? We are forced to the conclusion, not merely that nature has structure, but that it has forward-looking structure. Such seem to be the facts as indicated by present science.

* * *

How shall we interpret this evidence of cosmic structure? Can we interpret it entirely in physical terms? Is it due to the aggregate of matter with its interactions? The materialist insists that the control must be a physical control. But how can the measure and order of matter be derived from matter? The plausibility of the materialist lies in the fact that he assumes at the outset the structure and properties of matter and the conditions of nature. He points out that matter does combine into a variety of patterns when the conditions permit. There is, somehow, an innateness or tendency in nature towards greater complexity. Some elements have a special capacity to act as nuclei for larger syntheses. This is true not merely of atoms, such as carbon, but also of groups of atoms which function in chemical synthesis as single elements or radicles. "The idea that aggregates of atoms may function like a single atom in building up complexes was established by Gay-Lussac and later by Liebig in his classical work on benzoic acid in which he found the benzoyl radicle acting like a monovalent atom."[31] Such radicles or superatoms are found progressively in the syntheses of nature, especially in colloidal structures, and reach their greatest complexity in organic syntheses. The protein molecule behaves as a huge polyvalent atom. It is much more stable than a radioactive element though it is at least one hundred times heavier. But we must not

forget that these superatoms require highly specialized conditions. The fitness of the environment becomes an important problem. This is especially true of living things. But what accounts for the fitness of the environment?

It is not surprising that highly complex organizations of energy should manifest a novel ensemble of properties. It is the organization which must be accounted for, and the materialist furnishes no principle of organization except matter. The materialist says that matter does accomplish the marvelous results, and therefore matter can do it. But does matter accomplish the results? The materialist's explanation looks plausible because of the assumptions which he makes. But are the assumptions warranted on materialistic grounds? We must account for the measure and structure of matter. Does matter measure itself and organize itself? The control which determines the universal units and patterns of matter cannot be the scattered parts of matter; and a mere mechanical aggregate of parts serves no better. Further, what are we to understand by the innateness or tendency to increasing complexity in nature? This cannot be due to the mere parts of matter or to the random aggregates of matter. Like the measure and number of matter, it indicates a universal control which furnishes a field or environment for the progressive synthesis. We cannot separate the behavior of matter from its field, and this must ultimately be a cosmic field.

But if matter as parts and random aggregates of parts cannot account for the measure, number and patterns of matter, why not conceive the universe of matter as itself a physical whole, a superatom, which determines the character and transactions of its parts? This must be the final stand of materialism. But what is the evidence for such a cosmic superatom? In some sense the physical world hangs together, but it hangs together at

the lowest level as a gravitational field and an electromagnetic field. We know of various hierarchies of superatoms—molecules, complex molecules with their radicles, molar structures, organic structures—but these require highly specialized conditions. They are necessarily local and rare. There is no relevant analogy by which we can pass from the superatoms of specialized conditions to a superatom including the whole universe of matter and capable of accounting for the measure, number and structure of all the known integrations. To call Einstein's finite gravitational field (if it exists) a macroatom is a misuse of language. Even if we imagine with Abbé G. Lemaître that at an early stage of cosmic evolution there may have been atoms of the magnitude of stars, or even that the whole physical world was at one time one immense atom, without distinction of positive and negative electrons, and that all matter was held in this one field, we should not have accounted for the organization of matter with its levels as we know it, much less for the levels of life and mind as we find them in our experience. And the existence itself of such a superatom would remain unexplained.

To all appearances the physical world is pluralistic; and the maximum of integration is attained, not in the aggregate, but in certain favored local parts. Nor can we conceive how a strictly physical type of integration can account for superphysical levels, such as the levels of mind and their values. These must be irrational emergents in a world of merely physical energies. Finally, any merely physical conception of reality runs amuck on entropy. A merely physical world could not start itself and could run only a limited time after being started. The control which determines the units, structure and balance of the world of matter cannot itself be matter. It must lie in a universal field which is present everywhere to matter but is not merely a function of matter.

The vitalistic conception of the universe as one living organism* has great advantages, if you can assume the analogy. It could account for the uniformity of nature as we find it. It could furnish a control for the whole range of histories and account for a compensatory equilibrium. It would not run amuck on entropy since life can direct the course of energy and run energy up to higher potentials. But when we try to imagine our organic model as a picture of the world as we find it, it has insuperable difficulties. The analogy of the biological organism, taken strictly, requires that the living whole shall be made of living parts. It is true that the conception of matter has changed and that matter is no longer looked upon as inert but as energy, yet the distinction between material energy and organic energy remains. The great part of the world which is open to our observation is inorganic. Life is a late flowering in a few favored parts in the vast material world. It requires a highly specialized environment for its appearance and development. Even the basic material conditions of life, such as water and carbon dioxide, must be comparatively rare in our world. Though there must be in some sense a steering towards life, this, so far as we can see, cannot be due merely to life as distributed in the physical world. It is true that the conception of the universe as an organism need not commit itself to the subjective interpretation of space, time and matter. Fechner did not do so. But we cannot conceive such physical units as the earth as super-organisms, still less the vast parts of the universe where matter must necessarily exist in a comparatively disintegrated condition.

If we were to use an analogy from the organic realm, the analogy of biological generations would come nearer being relevant to the situation in nature than the indi-

* In Chapter IV I maintain that the universe must be permeated with life and mind and must function as a living whole but I do not say that it is one living organism. To say that a living spirit operates in the world is not saying that the world is one living thing.

vidual organism. There are in the universe, open to our observation, various histories at various levels of integration. The spiral nebulae exist at all stages of integration from the most homogeneous to the most heterogeneous. Stars, too, appear to fall into groups of various ages and stages of integration. In a universe which is a going concern, there must be a relation of equilibrium amongst these various cosmic histories—a relation of give and take. The course of any one history must be bound up somehow with the ensemble of histories within the field of cosmic control. There must be interaction and interstimulation in some way analogous to biological generations of various ages. But biological generations, though functioning through individual organisms, are not individuals. Moreover, cosmic histories cannot be regarded as biological histories, though life may figure in a cosmic history when the conditions become appropriate, which must be at a comparatively late stage. The mechanism of cosmic interaction cannot be of the biological type. In some way the cosmic field must be endowed with life, in order to guide towards life and to furnish an environment fit for life, but this does not mean that the universe is literally one organism nor that the component cosmic histories are life histories. They have degrees of freedom of another order from biological histories. The universe may behave as a living whole without being one organism, provided that it is controlled by spirit.

All systems which assume a perfectly integrated whole must subject the part to a perfect control by the whole, thus making the individual a mere function of the whole. But the world in which we live presents at least as much evidence of indeterminacy, disintegration and failure as it does of integration and purpose. No monistic conception has succeeded in accounting for the pluralism as we actually find it. If you say that this disappears for the superintelligence of the cosmos, we must own modestly that we are limited to human intelligence.

If, again, we consider the claim that the universe is a psychological whole, of the order of human consciousness or higher, the assumption seems even more improbable in view of the response of the world in which we live. Certainly only a small fraction even of living things responds as though its conduct were guided by ideas, not to say systematic purposes. It would be rash to suppose from such rare emergents that the world is one purposive individual. In fact it seems to act quite otherwise. If we try to get rid of the existence of matter, time and space by *a priori* reasoning, we do not thereby get rid of the appearances. The characteristics, which distinguish inorganic matter from the organic and psychological levels, still remain. We have all the gradations on our hands, as Leibniz and Hegel realized.

Those who have maintained that reality is a psychological whole have done so on certain epistemological grounds, not on the evidence of experience. They have started from the introspective predicament that everything of which we have knowledge must be in some sense experienced and by illicit inference, due to the ambiguity of the word, experience, they have converted experience as a relation into experience as a substantive in which everything must be contained. Strictly this must lead to solipsism, since the experience in which we introspect must be in its intimacy an individual experience. By a naïve inconsistency the psychological idealists have generally assumed that we can go from our own intimate centre of experience to other equally intimate centres by inference from bodily analogies, thus assuming the reality of body to prove the reality of other minds. Some have hinted at clairvoyance or telepathy in order to establish a direct relation between private individual centres of experience, but such means of communication, even if admitted to be veridic, seem to be possible only under extraordinary conditions. Most of our communication seems to be mediated in some way by an intervening

physical world. Others have boldly assumed that all the individual fields of experience are eternally integrated into an absolute experience and know one another through it. Presumably these fortunate philosophers have a direct knowledge of the absolute experience. The difficulty in that case is to explain our ignorance of one another and the universe. This ignorance is profound and seems to depend in a measure upon the apparent pluralism with its spatial and temporal conditions which are assumed to be appearances. After all, appearances are just the facts that we must explain.

We may leave the absolutists to enjoy their *a priori* omniscence. What interests us here is that, in whatever terms we project our experience of reality, we still have all the pluralism and gradations in it—all the way from the lowest inorganic level of energy to spiritual creativeness; and in spite of all epistemological hocus pocus only a small part of the world, as experienced by us, responds as though it were of the spiritual type. To say that the physical world is mere appearance does not get rid of our problem, for it is the business of philsophy "to save the appearances." There can be no *mere* appearance in the sense that nothing appears. The world is real for us as it appears from our human frame of reference, however it may appear to beings different from ourselves. Spiritual relations too are appearances in the sense that their significance varies with the frame of reference, including the history of the individual percipient. All that we experience in our moving, changing perspectives is characterized by relativity. If relativity makes experience unreal, we can perceive nothing real. On the other hand, if we maintain a degree of sanity and recognize with Hegel that the real appears, we have the whole cosmological problem on our hands, however euphemistic may be our terminology: for we must try to establish some relation amongst appearances of various kinds, with their orderliness and disorderliness, their integration

and distintegration. The world does not become any more unified than it appears to be by calling it Experience or Absolute with a capital initial. Hegel himself is confronted by "the broad ugly ditch" (with which Schelling taunted him) between the world of nature and the world of spirit. Invoking a mythological escape in the way of a "Fall" is at any rate a fall from philosophy.

The idealists of all types have expressed a sound intuition when they have maintained that mind is intrinsic to reality and not a mere accident in a foreign environment. Mind may appear at a late date in cosmic histories, but that does not mean that mind is an irrational emergent from the play of blind forces which have nothing to do with mind. The emergence of mind with its complicated conditions—physical, biological and social—must be due in some way to a cosmic field which owns the mental as implied in its structure, as the material atom appears in a cosmic field which indicates its structure. When mind appears it is at home in the universe. It can, in the process of discovery, re-create the structure of nature, be it at the material, organic or mental level. It can express the structure of matter and the structure of society. Nothing is foreign to it. This means that nature throughout is mind-controlled. But it does not mean that nature as a whole is a mind. This would mean that all the parts of nature are integrated as mental. The evidence which is available to us indicates, on the contrary, that only a very small part of nature has mental characteristics. To say that the vast part of nature which does not manifest mentality is sleeping or uncommunicative mind ignores the fact that mental behavior involves a certain type of organization, not only on the part of the individual but on the part of the milieu in which mental behavior appears. Mind is not merely a peculiar kind of stuff or substance but a peculiar kind of whole-pattern; and this whole-pattern, in the relations in which we know mind, includes the ensemble of conditions as well

as the individual centres. Once we forsake the path of evidence we land in a bog of sentimentalism.

It seems clear that we must abandon the conception of the universe as an integrated individual, whether in physical, organic or psychological terms. The world in which we live is a pluralistic world with various histories and their interactions. We have no right to suppose that the special characteristics of certain parts hold for the aggregate of parts. This is the fallacy of composition. Yet the facts of measure, number and structure remain. How shall we meet them? We must try to discover some factor in reality which can furnish guidance to the integrations of nature without being made up of the parts of nature.

* * *

We must take a fresh start in the investigation of the facts as we have them. Perhaps we may find the key to the problem in the dualism of matter and space which was already recognized by Leucippus in the fifth century B.C. Previous philosophers, dominated in their clod-rooted reactions by the sense of touch, had for the most part put the emphasis on matter. Parmenides is the extreme example of this emphasis. Everything real is body, and whatever is not body is unthinkable and must be ruled out. Therefore space and time must be unreal, and we are left with a solid spherical block. The discovery of space must be rated as one of the momentous insights in the history of human thought. It is true that for Leucippus space was just an infinite emptiness. But this was due in part to the difficulty in finding language to express the new concept. The word, being, had become associated with body; and Leucippus was obliged to call space non-being, in order to contrast it with body. But he is firm in his conviction that non-being is as real as being. The implications of space must still be developed. But Leucippus pointed the way to a non-material reality.

We have been over-awed by the immensity of matter in our earth-bound perspective. But what is the immensity of matter compared to the immensity of space? In our new conception of nature, matter has become, even in its greatest concentration, sparsely scattered dots or vibrations in the vastness of space—mere specks of dirt, the pessimist would say, in the unlimited transparency. May it not be that space is the important thing rather than the specks?

It is significant that at the very time that Leucippus discovered the dualism of matter and space, Anaxagoras discovered the dualism of matter and mind. Like Leucippus, Anaxagoras is hampered by the lack of language to express his discovery. He is obliged to use physical terms to express mind. Mind (*Nous*) is absolutely pure and unmixed, though it pervades a mixed world. "*Nous* is infinite and self-ruled, and is mixed with nothing, but is alone, itself by itself."[32] If it were a component in the mixture, it could not rule the mixture. It is "the thinnest of all things" and therefore can run through everything. It is eternal and omnipresent. "And *Nous,* which ever is, is certainly there, where everything else is, in the surrounding mass, and in what has been united with it and separated off from it."[33] It is for Anaxagoras chiefly the first cause which starts the original revolution by means of which worlds are formed. It is not an epiphenomenon as with the later sophisticated naturalists, but it has "the greatest strength" and "had power over the whole revolution, so that it began to revolve in the beginning." For Anaxagoras, mind is an absolute continuum without parts and as extensive as reality. Therefore it can be effective everywhere in ordering nature. Like space it is the same everywhere, but it is peculiarly effective in living things and most effective where the organism is equipped with the proper tools, such as the hand of man. That he means mind is clear because it "has all knowledge about everything." It is true that

in his description of nature Anaxagoras, like Newton, uses "secondary causes." But at any rate he, like Newton, holds that mind or God is the ultimate source of order in the universe.

Some have belittled Anaxagoras' discovery of mind because he uses physical language in describing it. But physical language comes nearer expressing the cosmic significance of mind than mathematical language. In the mathematical tradition, mind becomes a point without extension. Descartes sums up this tradition in holding that mind is thinking and non-extended, while body is non-thinking and extended. But this tradition makes it impossible to think of mind as pervading the organism and the cosmos. The prejudice against thinking of mind as extensive is due to the mathematical conception of extension as infinitely divisible. But this is merely a mathematical convention and has no metaphysical significance. For Spinoza the attribute of extension is indivisible because it is an attribute of God. If extension is an attribute of mind, it is indivisible if mind is an indivisible whole. On the other hand, the mathematical point may be regarded as an infinite assemblage of positions. To rest the conviction for the indivisibility and immortality of the soul on the analogy of the mathematical point is to rest on an illusion. The intuition of Anaxagoras is sound, and though we may have to treat his physical language as metaphorical, we must also own that we must still borrow the language of physics when we attempt to express the cosmic field of mind. Anaxagoras created an epoch in thought by discovering the dualism of matter and mind, as did Leucippus by discovering the dualism of matter and space. Will the two dualisms prove to be one?

The dualism of space and matter has played an important rôle in modern science from the seventeenth century onwards, even though the attention of the scientist has been captured by matter. Acceleration cannot be de-

fined except by taking account of distance and time. Gravitation cannot be expressed in terms of mere masses of matter. It is necessary also to take account of space (and with Einstein of space-time). Newton regarded space as absolute and as distinct from matter. Matter can have absolute position and absolute motion with reference to space, though such absoluteness must be purely theoretical, since in practice we ascertain our motion and position relative to things in space.

Einstein's theory of gravitation,[34] though dualistic, subordinates space to matter, since space is supposed to alter its curvature or structure in the neighborhood of masses of matter, which are apparently distributed at random. Gravitation means that light and other energies follow the curvature of space as the split of the wood follows the grain. There is no attraction of matter upon matter as the Newtonian theory of gravitation implies. But how can matter contribute geometry to space? Einstein's theory of gravitation* provides no conception of cosmic structure. It is essentially mechanistic and differs from Newtonian physics only in mathematical method. It is true that Einstein assumed at one time that the universe is finite, but this hypothesis was based upon a supposed distribution of matter. It has nothing to do with any inherent structure of the world. Einstein assumes that, if the lengths of bodies and the intervals of clocks are congruous in one part of the nexus of space-time, they will be congruous if brought together in any other part, irrespective of their variations in their intervening course. Weyl has pointed out that such could be the case only if there is a cosmic curvature or control which

* Einstein's theory of gravitation is called his general theory of relativity. The special theory assumes Newtonian frames of reference in uniform motion, but the lengths and the time intervals vary in perspective with relative motion of two frames of reference, the lengths being foreshortened and the intervals of time being correspondingly lengthened. The effect is reversible. Every observer regards the frame of reference upon which he makes his measurements as stationary. That is the significance of "local time" and "local space."

could guarantee the congruence. Only such a control could explain the constancy of the charge of the electron anywhere in the cosmos.

In later writings[35] Einstein has emphasized explicitly the absolute dualism of matter and space. Space has entirely distinct properties from matter. Space has no parts which can be tracked through time. It has no mechanical or kinematical properties. It is physically, not merely mathematically, continuous. How could such a space be influenced by matter? Space for Einstein is evidently a physical field and not what the old physics meant by space. Recently Einstein[36] is inclined to reverse his earlier emphasis and to make space the primary reality and matter secondary. He hopes to deduce all the properties of the physical world from geometry. Space will eat up matter. To become thus self-sufficient space must assume dynamic properties. It must possess direction. But how can we get the diversity of matter out of space? (Just now Einstein professes himself baffled in this ambitious attempt.) Lord Kelvin attempted to evolve matter from a homogeneous ether, but he was obliged to introduce motion. In fact it would be necessary to introduce diversity of motion and to assume properties of ether of such a kind that it could be stiffened into matter by motion. To the uninitiated outsider it looks as though the real reason why space eats up matter for Einstein is that after having derived his various types of curvature of space from the presence of various masses of matter, by a sleight of hand he makes the masses of matter peculiarities of his geometry of space. Matter becomes, as Eddington had already put it, a particular "bulge" in space-time. The interesting thing to the philosopher is that space for Einstein is assuming, more and more, a mystical character. It seems to be the symbol of a veiled pantheistic conception of reality.* We

* The attempt of Weyl, Eddington and Einstein to find postulates of such generality as shall make it possible to include the gravitational field

are reminded of Newton's identification of space with the Universal Sensorium.

We recall that for Henry More and Newton, space becomes another name for the omnipresent creativeness of God. In this divine medium "we live and move and have our being" as the Stoic poet, Aratus, said. The whole structure of the world depends upon this omnipresence, yet Newton is clear that the world is not the body of God, though God is present to the world everywhere. His conception resembles in this respect that of St. Thomas who says that God is present everywhere "by his own essence, not the essence of the creature." But, for St. Thomas, God is present as the efficient cause.* For Newton, as for St. Augustine, God is substantially present. Newton speaks the dualistic language of Platonism, while St. Augustine and St. Thomas are caught in a dogmatic tradition which makes it incumbent upon them to make God the absolute creator of everything—matter and form. For them the world depends absolutely upon God. If God withdrew his presence everything would vanish—not merely collapse into chaos, as Plato supposed, but become non-existent. Everything, even the devil, derives its existence from God.

Origen and St. Augustine had departed from the dualistic tradition of the Hebrew Scriptures and of Platonism and fastened upon the church a monistic conception of creation. This was due in part to the desperate struggle of Christianity with Manichæism, with its metaphysical dualism of good and evil. Matter, owing to oriental influence, had been degraded into a funda-

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and the electromagnetic field in one set of equations seems to be a purely methodological device. The facts, as Einstein points out, indicate that at any rate the electromagnetic field is independent of the gravitational field. Whitehead's method of extensive abstraction is an abstraction from Newtonian physics, with all its liabilities. It does not meet the requirements of quantum physics.

* Newton objects to St. Thomas' conception of the divine presence as the efficient cause instead of the substantial presence. St. Augustine would be nearer Newton.

mentally evil principle, instead of being the comparatively plastic material for creative formation as it was for Plato. But beside the Manichæan crisis there was the positive influence of the spirit of Rome, which emphasized power as the ultimate thing. It was thought that it was complimentary to God to ascribe to Him omnipotent power. It seemed that a God who works in a plural world of individuals is limited, and God must not be limited. They thus made God responsible for things as they are. It is true that they tried to save the character of God by introducing indeterminism—the fall of man—, but this meant really reinstating the old dualism which could not be tolerated. Hence the doctrine of predestination, according to which everything is part of the fore-seeing plan of God. They accepted the conception of the universe as an organism from Plato. It is a smug little world with the earth at the bottom and hierarchies of stars and angels up to God at the top. Everything happens for the perfection of the whole, and this for St. Augustine is a historic whole, not merely a spatial whole.

In practice the Catholic Church has always rejected predestination and held to pluralism of individual initiative. Predestination would make the church useless. St. Thomas even argues that a world of individual indeterminism is superior to a world that is stereotyped; but he tries in vain to reconcile this with divine omniscience; and he relies upon God to make evil into good, so that creation shall be a perfect whole. But this is merely a pious hope, even if supported by the authority of St. Augustine. We must rid the scholastic tradition of its *a priori* excrescence of creation out of nothing. God is present everywhere and always, as creative spirit giving form to our world, but matter does not as mere primitive matter derive from God, though it owes its structure to God. We must return to the intuition of God as omnipresent spirit who creates and redeems in

a pluralistic indeterminate world. There is no limitation in God, since God's life is perfect in its own right. The limitation lies in the finite response to God. The perfect unity and harmony are in God. There is no evidence for the universe being a perfect whole though there is evidence of a whole-control. It does not seem to be the best possible world, and it may not be the worst possible.

We may find, with Henry More and Newton, that this Presence is what science, pursuant to its own demands, has had to recognize as space. For mechanistic science, only the most abstract properties of this medium were relevant. Its chief characteristics were that it was an extensive entity, an absolute continuum, perfectly conductive, but with none of the properties of matter. For merely mechanical relations such a neutral space sufficed. But it no longer suffices. The tendency in recent physics is to regard the field as responsible for the tendency to structure in matter. Weyl thinks that all the properties of matter are due to the field. This means in the language of Schrödinger that they are due to an inherent *Gestalt* or pattern which is not a sum of individual pulses or waves of energy but super-imposed upon them and immanent in nature. This does not mean that matter can be reduced entirely into the field. We cannot do without the individual corpuscles of matter. Matter in action is both wave-like and corpuscular. But the guidance is furnished by the field. The question is, how shall we conceive the existence of *Gestalt*? It is clear that it does not derive from the individual corpuscles. It must therefore be due to the field. But, on the other hand, the field-pattern cannot be indifferent to the corpuscles. It varies with the number of corpuscles involved. Matter takes on a vast variety of patterns in varying conditions and complexities. Are all these patterns innate in the field and merely waiting for the conditions? Or are they created with the material conditions?

If we conceive space as the universal matrix of order, then corpuscular matter becomes the amorphous plural material, with its indeterminacy and inertia, but also plasticity to be ordered in the lattice-work of space. If, however, we recognize the facts of change and emergence everywhere, we cannot suppose that space is a stereotyped order. Space is not absolutely and eternally figured in such a way that mere variation in position means variation in structure. This is contrary to evidence. The same structure can be repeated wherever the conditions are appropriate. Space must be capable of being all structure at any place. This structure must be a hierarchical* dynamic structure. It must have cumulative temporal direction. If the field of space sets the order of nature, then space must act as a whole, containing in itself all the patterns and hierarchies of patterns of all possible integrations from the atom to creative genius. But the only way in which we can understand space as acting as a whole is to conceive it as a living spontaneous activity of the order of creative genius, which is present in its integrity everywhere and always, steering the material conditions towards structure and everywhere contributing such structure as the readiness of the individual and the ensemble of conditions permit whether H_2O or a human personality. The patterns of spiritual creativeness as manifest in social institutions, aesthetic production, ethical scales of value, scientific hypotheses and systems of philosophy are as truly manifestations of a structure which is immanent in the genius of nature as are the patterns of atoms, molecules and crystals or the forms of plant and animal life.

In all of these expressions of the genius of nature, such form is created as the history and conditions of the individual permit, and in all of them the formative

* i.e., hierarchical from our finite perspective of evaluation from our plural frames of reference. Hierarchy could have no meaning within the harmony of the life of space when considered as it is for itself.

genius is wiser than the individual. There is this remarkable difference, however, that in the stages of nature below creative intelligence, the formative process aparently cannot fail when the conditions are appropriate, while in the part of nature where the adaptation depends upon creative intelligence we may fail to discover the suitable form and therefore fail to realize it. We are disposed on this account to regard the form in the latter case as subjective. But in fact, as Plato truly saw, the particular form of beauty, truth or goodness exists as truly in nature as the particular form of a crystal or a plant. There is a viable form—an appropriate pattern— for the harmonious realization of the best life as truly as there is a viable pattern for the synthesis of atoms into a molecule. We do not create the pattern arbitrarily, but it is our privilege and obligation as free spirits to enter creatively into the process of discovery of the most suitable form for expressing our life, individual and social; and upon this discovery depends our worth and happiness.

While the facts indicate a universal cosmic control, they also indicate that the emergence of structure in the concrete is not indifferent to the conditions of density, temperature, electric field, emotional and volitional readiness. The preparedness for structure cannot be chance. Only if space actively guides the flux of nature toward structure can we understand how the relevant structure emerges in the fullness of time. If space were an inert stereotyped structure, there would be no stimulus toward structure and the taking on of structure by the indeterminate plural pulses of energy would be mere accident. It is inconceivable that there should be the movement towards cumulative organization which we observe, if there were no inducement to order. Space must be present to matter, not merely neutrally but constructively, yet not coercively but persuasively (as Plato would say). The dualism of matter and space be-

comes the dualism of matter and spirit—matter being the plural and indeterminate which is to be ordered, and spirit being the ordering genius.

No doubt it will be a great wrench to our habits of thought to identify space with spirit. Through long usage, the idea of space, as an extensive emptiness, has been so ingrained in our minds that it requires a great imaginative effort to realize "the Life of Space" as a great poet-philosopher, Maurice Maeterlinck, has called it. How unlike the conventional neutral space of classical mechanics! It must be dynamic and directive structure—not merely structure in the inert geometrical sense, but living genius working creatively towards wholeness in our passing pluralistic world, while it embodies eternally a complete symphony in itself. This living space includes cosmic space and cosmic time. Space and time are separate in our thought, but not in the life of space. This life—the spirit of the whole—is the meaning of past, present and future. These are divided in our consciousness through our interest and activity. They are relative to our frame of reference as particular histories. But from the point of view of creative space they constitute one teleological whole, however feebly it may infiltrate into our limited existence. There is an eternal rhythm in the cosmos to which the parts may become attuned. This living space is not partitioned by dimensions. These are devices of our thought to describe the relations of material entities in space. They have no metaphysical significance. Mechanical relations can be described in three dimensions, if we take static relations, or in four if we take account of motion and so include time in our description. The more complex chemical relations require more dimensions. But dimensions have reference to relations in nature as we abstract them and schematize them for our pragmatic purposes. They have no relevance to the creative life of space.

If we think of space as the geometrical three-dimen-

sional space of classical physics, then it seems indeed (as Maeterlinck feels) as though the emergent facts of life and mind, the infinite wealth of value and meaning, somehow infiltrate from a fourth dimension. For Maeterlinck[37] these facts exist in a hyper-space beyond the space of three dimensions. The phenomena of our spiritual activity, our ideals, thoughts, aesthetic passions do indeed transcend the space of physics. But more truly, as Henry More expressed it, the conventional space of mechanical physics is but a pale abstraction from the real space which is the living directing medium in which we live and which in our highest inspirations we in a measure grasp.

For Maeterlinck, who approaches space through the conventions of geometry, space is at bottom "the outline of the immense shadow of the enigma of the universe which is at the same time the shadow of the Master of worlds." Maeterlinck expresses the intuition of a great poet when he tells us that "God is the spirit of the universe—who fills all time and all space, or rather is infinite space and time." But he is repeating the language of philosophical tradition when he says that "space and time are only forms of the unlimited which are accessible to our eyes or our imagination." The God of Maeterlinck, like the God of Pseudo-Dionysius, Erigena and the Hindu mystics, is a God who transcends all distinctions, mysterious and unknowable. The mystics in putting God beyond all distinctions have made him, in fact, Nothing—a great emptiness like empty space.

God is the real life of space, present to everything, everywhere and always, in its creative activity. God is truly present in his creative relation to the levels of reality in which we live. No doubt this life of space in its own essence is beyond our artificial description, and it must exceed the highest levels of organization that we know. But the hither side is a revelation of the creative life of God; and while we cannot know it in its

wholeness, it sheds light and beauty on the fragment of which we are conscious. As the schoolmen would say, God includes eminenter (i.e., in a far higher degree) the significance and value which we can share. Though his life transcends infinitely anything we can know, yet through grace his abundance radiates into our poverty, if we will allow it. Because the Spirit of the universe is present in us, it guides those that are devout in the direction of truth. It is better at any rate to characterize God with the value and meaning which we can, in a measure, know than to make him a mere abstraction. And because of the indwelling spirit of truth, the sincere seekers after truth are guided by feelings and presentiments which far outstrip attainment.

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We have emphasized the dualism of matter and spirit. They are logically and metaphysically distinct. But this does not mean that they exist as separate in nature. Matter does not exist as chaos in nature. It has measure and number. It has also, as we observe it, such a degree of organization as the conditions permit. Spirit pervades matter everywhere and induces toward organization. Matter exists in a field of spirit. The field of spirit is independent of matter, as the electromagnetic field is independent of the gravitational field. But the organization of matter is dependent upon the spiritual field. The latter furnishes "measure and number." What organization matter attains depends upon the willingness and capacity of matter to embody form. As matter assumes form there is a drive towards further form from the immanent form attained and the immanent activity of cosmic spirit. At the stage of human creative activity there is a feeling for form which furnishes the dynamics for further creativeness. But neither at the conscious level of creative thought nor at the levels of unconscious striving for form is there only one prescribed form

which energy must assume at a given stage. In the organization of matter, there is at any stage a multiplicity of permissible forms of organization. Matter may "choose" to remain at a certain level of organization or lack of organization. It may advance towards various types of organization, some of which in the fitness of nature permit of still further advance. Hence the variety of types and complexities in the existent world.

In the advance of life again there is open a choice of routes of organizations as shown in the differentiation of plant and animal, and again in the various routes of the branches or phyla of plant and animal life with the variety of adaptations of these phyla to their environment. There is a creative reaching out of life towards the creative genius immanent in nature, because this creative genius encourages and guides towards organization, though it does not dictate the specific form. The random efforts which fail to attain permissible form do not count in the creative advance. The great mass of failures indicates the law that many are called but few are chosen. On the level of conscious creativeness it must be even clearer that there is not just one route of permissible advance whether in intellectual, moral or aesthetic activity. There have been many methods of realizing intellectual advance in the way of ordering the facts of experience, many ways of organizing human relations, many routes of artistic creation. But while various routes have been successful for the time being, some of these routes open up greater possibilities of future advance than others. It seems clear that the genius of the universe works toward stimulating creators and not toward dictating one route of creation.

We are obliged to recognize that there is a great deal of predestination in creative evolution. We cannot separate the individual from history. The individual can only be understood as part of a route of advance; and the route of advance in which the individual must real-

ize its specific form is predetermined in its general characteristics. On the material level certain routes of advance were long ago established through astronomical and geological evolution, such as atomic, molecular and molar structures which furnish the environment of life. Life again radiated a long time ago into various routes. Plant and animal life diverged and each established its successive phyla, which conditioned further advance. At a late stage, different human routes diverged as tentative experiments. Most of these failed to attain the necessary adaptation for maintenance. Of one of these human routes we are a part.

It must be clear that from a biological point of view the creative possibilities of the individual are largely predetermined by the route of development of which it is a part. A plant seed cannot develop into an animal or an animal seed into a plant. An oak cannot evolve into an elm or a cat into a dog. A human individual is conditioned not only by the general human route but by the stock of which it is a part. It is further conditioned by its social route of advance. Archimedes may have been as great a genius as Newton but he did not have the advantage of the historical advance of which Newton was a part. Newton could reach further, as he gratefully acknowledged, because he stood on the shoulders of giants. But while creative advance is conditioned in a general way by the route of which the individual is a part, whether crystal or flower or animal or man, there are the possibilities of individual initiative within the route and stage of development. At every stage there is the stimulus to new creativeness; and at every stage the creative urge of the cosmos is conditioned by the capacity and willingness of the individual. At every stage there is risk and opportunity. If there is initiative, there must be a considerable risk of failure in the complex maze of the universe. But there is also the possibility of the individual becoming a bridge towards a higher type.

The experimental facts of science, as well as primordial human conviction, indicate that there is a considerable degree of indeterminacy in our world. Individual electrons do not fall automatically and necessarily into specific patterns and levels. There is an aspect of "choice" or "preference" even at the simplest level of nature. While the indeterminacy is no doubt more and more limited with increasing complexity of organization, yet inasmuch as the more complex structures are built out of electrons, there must be an element of indeterminacy even in conduct which is guided by prevision in the way of ideas and purposes. If there is absolute individual choice, i.e., if the individual might choose otherwise at a given juncture of events, then failure is due to the process of adaptation by the individual. The individual is responsible and God is justified, as Plato would say. The individual may choose contrary to the spirit of the whole, whether from ignorance or laziness. To grasp the relevant structure requires creative effort; and at best we succeed only imperfectly. In so far as we fail, we cannot prosper. Our act does not figure in the universal whole-making process. Such a conception of reality can account for the failures and maladjustments which are so real a part of our experience—sometimes tragic, sometimes comic. After all we must start from our human experience to work towards some supra-human structure.

It will be evident that indeterminacy and freedom, so far from meaning the same, are really opposed concepts. Both, it is true, imply spontaneity as contrasted with routine. But freedom in the true sense means the capacity and will to determine one's conduct with reference to ideal structure, so as to attain the largest possible range of development. With greater complexity the amount of absolute indeterminacy becomes limited, but the degrees of freedom, the possible choices, increase. The normal direction of development for the individual

is that which increases his range of freedom and his capacity for action and enjoyment. This does not mean indeterminateness in the sense of freakishness, but to act with the greatest possible insight into the permissible structure of the situation. There is still a range of variation of response. Even habits are not absolutely stereotyped. But the variation under normal conditions takes place within the structural control. It is in pathological dissociation where it becomes freakish. The spontaneity of creative thought, when at a late stage it enters into conduct, is of another order from the spontaneity of the electron.

We may say with St. Thomas that the order in the Universe is implied in God. But this does not mean the implication of formal logic—an implication following from an immutable system in an immutable mind. Rather it is implied in the living creative genius of God. The relation of God to the world is a creative relation. God, present in everything and always, cooperates to create the suitable pattern as the individual responsiveness and capacity permit, even as the artist creates the pattern suitable to his medium. Here lies the significance of grace, for in creating we are more than we are and "are wiser than we know."[37a] We rise above routine, above conventions. There are variations in the creative process, just because the individual part is not a mere function of God, but has an initiative of its own. It may respond perversely and fail to continue as a constructive part in the process. The quantitative smallness of the individual, moreover, does not affect his qualitative importance. He may be but a speck, but he need not be just dirt.

It is true that we are mostly immured behind a wall of flesh in this existence. Our desires are mostly bound up with the biological body. The mystic sighs: "Oh, that this fleshly envelope would melt into the larger melody and fragrance from which the body separates me in this gross absorption with myself!" But the body may be

a door instead of a wall, or, better yet, an instrument which may be tuned to the eternal harmony and so may discourse excellent music. The lowliest mechanisms of the body—the mechanisms of sense, of movement, of organic maintenance, individual and racial—contribute importantly to personal consciousness, and when sublimated into the good life bear testimony to the reality and beauty of the enveloping harmony. Heraclitus is reported to have invited his visitors to the kitchen, saying: "Here, too, are gods." The soul that lives in God becomes the possessor of all the riches of God insofar as it is capable. When it is tuned to the harmony of God, the everlasting and pervasive stream of music surges through it with an infinite joy of life.

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It appears that we must understand reality as in a fundamental sense dualistic in its constitution. There are two fundamental realms of reality—that of matter and that of spirit. The realm of matter depends upon that of spirit for its organization, but in turn furnishes a sphere of creativeness for spirit. It is not the only sphere, for there is creativeness in the realm of spirit as well as of matter. We experiment with ideas as well as with material things; and in the experimentation with ideas new ideas emerge, new discoveries in the realm of meaning. These may have relevance in the interpretation of the material world, but they may have reference also to the enrichment of life on a spiritual plane. They may enhance the value of life. In the association of spirit with spirit in a great cause, new spirit may emerge—nobler personality, nobler spiritual unity, more expressive of the spiritual harmony which pervades the cosmos. But even in the highest spiritual creativeness, matter furnishes the instrumentation. We require the symbolism of language, the incarnation of meaning in art, for spiritual expression and communication.

It appears that reality in the concrete is pluralistic and of various levels. The attempts to reduce reality to some "type phenomenon," to use a phrase of Bosanquet's, have failed. We have passed in review the efforts to integrate appearances into some familiar type—material, biological, psychological—; but they have all done violence to some of the facts as we know them. The universe cannot be integrated into one individual, be it a physical atom, an organism, or a mind. Even though we could integrate the physical world into one immense physical superatom, the biological and psychological types of fact would remain as irrational emergents. If we try to conceive the universe as an organism, we face the fact that a vast deal of the universe is material in its own right and is not integrated into living individuals. If again we conceive the universe as a psychological whole, we cannot account for the appearances which are physical or biological and do not manifest the characteristics of mind. Bosanquet, in spite of his warning that we must not attempt to reduce reality to some type of phenomenon, apparently yielded to the lure of simplification by reducing everything to the psychological type—one inclusive experience of which everything is an aspect and which he called the Absolute. But there is a great mass of appearances which refuses to be integrated into any such unity. Are we obliged then to acknowledge the three great types of facts as separate compartments in our world?

There are two reasons why this is impossible. One is the genetic reason—the historical relation of these facts. The material part of the world must furnish the proper environment, be the fostering mother of life. The fitness of the physical environment for life is so complicated that we must believe that the dynamic organization of nature has reference to life—not only locally but by a cosmic control which makes the local conditions possible. Only a small part of physical matter enters into the

building of life, but the vast part which does not do so may be important as the frame work of life. It is also capable of stimulating admiration on its own account. Life in turn must develop the still more complicated conditions which make creative intelligence possible. Again, only a small part of the physical and organic world is directly involved in the individual integration in which intelligence functions, but the rest must furnish a fit environment for such integration. The great types of phenomena then are genetically related, and this indicates some whole-pattern which steers their course amid the vicissitudes of nature.

Another reason is the aesthetic community of mind with all the types of nature. The crystal, the flower, the animal cannot establish psychological communication with us, but nevertheless we can enter into sympathetic rapport with them in the way of at least partial understanding and appreciation. There is a spiritual community between mind and the other types of organization; and this indicates that, though they cannot be recognized as spiritual facts, yet they have a spiritual aspect in which mind feels at home. Art and science point to some sort of community in nature. We do not change the mountain into mind by perceiving it and interpreting it in science and art, but it cannot be entirely foreign to mind; or science and art would be irrelevant. The universe is not integrated into one individual—material, biological or psychological—, but in a large sense it must function as a whole in order to explain the genetic relationship in nature and the community of mind with nature. There must be a whole-making activity in the universe, creative of a marvelous variety of wholes and hierarchies of wholes with subordination to dominant wholes; with interaction, interstimulation, and compensations amongst histories of various levels, under the guidance of a cosmic control. While the universe is not an organism, it acts as a living whole in its self-main-

tenance and whole-making. This whole-making must span the whole range of constructive activity from the atom to genius. Only a spiritual field is adequate to this.

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We cannot hope to conceive clearly, the *Gestalt* of the whole which we call the universe. But we must try analogies and select the analogy which seems most probable. If the ultimate guiding field must be of the order of spirit, our analogies must be taken from the realm of spirit. Plato, the supreme philosophic artist, made the illuminating suggestion that the universe is divine art, but he had in mind plastic art. This implies too external a relation. St. Augustine, who also had a strong aesthetic sense, suggests the analogy of a painting in which the dark shades are needed for contrast to bring out the brighter colours. But this is a static metaphor, and the universe is certainly dynamic. More significant is his analogy of a grand poem with its strophes and antistrophes, making one dynamic unity. Here he recognizes that nature must be conceived as a temporal whole and not merely as a spatial whole. But St. Augustine is a monist. Everything is subordinated to one omnipotent will. He sacrifices the individual to the perfection of the scheme. He fails to recognize the pluralism of the world as it is. The realization of a universal scheme may be better or worse according to our participation.

If we must try an analogy, the drama is more satisfying than either the statue, the painting or the poem. The actors are distinct individuals with varying initiatives and capacities. They play different rôles; and there are actors of many grades. St. Augustine and St. Thomas both recognized that the lowlier levels of existence—the levels of matter and organic life—have their rôle to play and are necessary in the scheme as a whole. They are also beautiful in their own way as the expression of the master genius, and may be a perennial source of de-

light to us. There must be a variety of parts of various ranks to make possible the culmination in such play of intelligence and appreciation as we are capable of in our best moments. In some sense the universe, I believe, is a dramatic unity which depends for its realization on the initiative and willingness of the parts; and even the lowliest parts have more initiative than we understand. We know now that animals learn not merely by mechanical trial and error but contribute a sort of insight to the unusual situation. They must discriminate and observe to some extent. Even electrons seem to have some sort of initiative, though we cannot translate it into our language. If there is genuine initiative, the whole cannot be predetermined in detail. There must necessarily be a great deal of tragedy from false starts. But since constructive activities have greater persistence and fecundity than the destructive, we may believe that in the course of history the better triumphs, though it may not be the best.

At best the universe is a mysterious drama. The great mass of the actors in this drama can have no consciousness that there may be a plot in which they are participating. Even reflective beings like ourselves can at best guess. We know nothing of our entrances and our exits. We move in, somehow, with the scene in which we play a fitful part, crabbing our lines, interfering with one another's rôles. The whole scene seems mostly a babel of tongues, signifying nothing. And the scene of our little life moves out as mysteriously as it moves in. Other scenes with other actors continue the human drama, which is a passing part in the cosmic procession of which solar systems and galaxies are acts, moving uncomprehendingly in a scheme which for the master artist may be a drama. In a large way the play goes on, one cosmic epoch preparing the stage for another, whatever may be the tragedy of the individual performers. Yet the master of the show may care more for the indi-

vidual actors than for the immensity and scenery of the stage. The drama of nature, so far as we can see, is, when taken by itself, futile and tragic, doing and undoing its work with no respect for the actors. If the drama of existence has any ultimate meaning, it must be in terms of spiritual realization and not merely material realization.

If the universe is akin to a dramatic whole, the later acts should disclose more of the plot than the earlier. Only at the highest level, known to us, appears the type of whole which is consciously creative—mind, spirit, which is an originative activity and not a mere mechanism, though it uses mechanisms, whether they be organic mechanisms or artificial mechanisms, for realizing its purposes. Here the soul is no longer adherent to the organism—a mere instrument to realize its wants—but is free to use the organism, as well as inorganic tools, for its creative end. Here we believe that we have something akin to the supreme creative genius in the universe. It seems that the plot must be to produce free creators who shall be capable, even though in a small and fragmentary way, of entering into the meaning of things; who may attain a significance of their own in the economy of spirit, and who may thus triumph over the flux of material worlds. These are the staging of the drama and not its rationale.

The temporal and the eternal are both given their due significance in such a conception of reality. There is eternity of form, but this eternity of form does not depend upon its temporal duration. The eternal is that which is significant in the flux. The structure of reality is eternal; and it is manifest in a measure, as the conditions permit, in the temporal flux of individual histories. But the form does not merely emerge from the flux. It legislates to the flux—not in the sense that the individual history must fall into a prescribed stereotyped form, but in the sense that only when the finite individual co-

operates creatively with the formative genius in nature can he attain to a harmonious and satisfactory life. The form-creating activity is present to the whole temporal flux in its various histories and stages, but the flux can attain only such form as is appropriate to it in the particular stage of history. "The chief thing is readiness," as Shakespeare's Hamlet says; and this involves both the capacity and the willingness of the individual. God is the same always and everywhere, though not equally effective because of the limitations of the finite. Creation is a living spontaneous process. It is not a stereotyped affair. There is not a ready-made whole-form, present intact from the beginning of an individual history to the end. The suitable form is created in the process. In this creation the individual initiative, the temporal environment, physical and social, and the pervasive genius of the universe are all present and interacting to make the unique history.

Soul in the finite is an ever shifting, vanishing thing like the changing perspective of the rainbow, yet the soul as created is a whole in its dynamic span—the whole of the melody though the tones perish, the whole of the song though the strophes melt into new ones. The eternal is not measured by temporal duration. The eternal is the significant and valuable, whether it endures for ages or the fraction of a second. Every moment in the transition shines with the eternal glory of the form which is incarnated and which gives it beauty and meaning. There can be no symphony without movements in which the harmony of the whole is creatively expressed, shining through their vanishings. In some choice poem or personality the eternal may be so perfectly realized in the temporal passage that the eternal can own the temporal without qualification; and yet there is the duality of the eternal spirit and the finite. This would be incarnation par excellence.

This conception of God solves the problem of trans-

cendence and immanence. God is transcendent in that he exists in his own essence, always and everywhere. He is not an integration of finite parts, but enjoys a life of his own of absolute perfection. But God is immanent in that he is present to-and-in all finite individuals to guide, to heal, to transform into beauty, so far as the individual permits. He does not exist in statuesque isolation. Salvation means that the finite individual may eventually become so transformed as to incarnate the intention of God in itself and thus become immortal through the love of God, though such rapport can be reached only prospectively under our finite limitations.

When we have reached the limits of our little knowledge we must confess in awe with the ancient poet: "Clouds and darkness are round about Him." Happy are we if we can discern a still small voice of encouragement and love, bidding us go on into the untrodden unknown. We must beware of a cheap and easy credulity, rooted in the will-to-believe. Far better to confess honestly our ignorance and pray for light. This confession does more honor to God than a pretended wisdom. The best we can do is to keep our soul open to little sparks of thought from the great illumination. Perhaps these sparks may accumulate in the life of man through the ages and by striking fire ever and anon in creative souls light up the darkness a little farther ahead.

Chapter 7

THE COSMIC TRAGEDY

Surveying the experience of man, an honest mind, which has not been enchanted by theory nor made callous by cynicism, must find with Plato that this is a mixed world of sweet and bitter, of good and evil. We find meaning, beauty, and goodness in it. But there is also confusion, ugliness, and pain. We may live by animal faith and accept the good as good and the bad as bad without question. But a reflective mind can not rest satisfied in taking things as they come. It tries to discover some plot in things. If it is optimistic it tries to see good in things that seem bad; and if it is pessimistic it tries to see bad in things that seem good. It is ever striving to bring together our disjointed experiences into a whole which shall make them significant. When values are seen in perspective they blend into a bright or sombre tone, whether the whole which we contemplate be the web of our own life or the web of the universe. The mottled fact is that "the web of our life is of a mingled yarn, good and ill together."[37b] But which dominates? Is life fundamentally comedy or tragedy?

* * *

Poets and philosophers, mindful of how much in life appears tragic, have tried "to justify the ways of God to man." Optimistic minds have duped themselves into believing that what appears evil is really good. They have pictured reality as one vast and perfect whole towards which everything contributes. There must be no flaw in its unity. Some have thought of this unity as an eternal scheme which timelessly unfolds its implications to the reflective mind and have brushed aside, with one grand sweep, the temporal vicissitudes of our existence as mere appearance. Some have conceived this unity as

one great temporal drama which moves to its finale as the realization of an eternal plan. The drama must be perfect and unmarred by any element of chance. It makes no difference practically whether we conceive the existent world as the revelation of an immanent spirit, which expresses itself in the moments of the whole; or regard it as an arbitrary act of creation. The world, on either view, is the perfect staging of a plan by an omnipotent and omniscient spirit. Theologians have devoted lengthy arguments to prove that the world must be a perfect whole, for a perfect being, who is omnipotent and omniscient, cannot be defeated. Everything therefore must contribute to the perfection of the scheme. Yes, even the damned must enhance the glory of God. The perfection of the whole may be even more perfectly realized by the inequality and imperfection of the parts. It is the whole that matters, not the individual. Evil is turned into good in the providence of the whole; the dark shadows are needed in the picture to heighten by contrast the eternal radiance; the discord only makes richer the eternal harmony.

Since the idea of evolution came to dominate our thinking, this religious optimism has staged itself in evolutionary terms. The course of nature becomes the unfolding of an eternal plan. Through the ages runs one increasing purpose, which widens to our vision with the course of the sun. Evolution is a theophany—the revelation of

> One God, one law, one element,
> And one far-off divine event
> To which the whole creation moves.[38]

Naturalism receives a religious baptism. Evolution means infinite progress. But Tennyson's optimism is in the minor key. It does not have the robustness of mediaeval faith. The process of natural selection is "red in tooth and claw." It is brutally careless of the single life, and careful only of the type. And it is not over-careful even of the type, for the rocks are littered with extinct

species. Then there is the almost overwhelming mystery of pain and sorrow. But the poet still entertains the pious hope that "good will be the final goal of ill," and that evolution is a steady climb of

> the great world's altar stairs,
> that slope through darkness up to God.

In the twentieth century, the apotheosis of naturalism has become more complacent and easy going. The supernatural aspect has disappeared. Now nature just emerges of itself into ever higher levels. The primordial matrix emerges into material structures, and matter emerges into life, and life emerges into mind, and ever on—into deity.[39] If we ask the reason for this potency of the lower to emerge into the higher, we are told that there is a *nisus* or tendency immanent in the process which bids it neither "sit nor stand, but go"—ever higher. If you probe deeper, you may find a pantheistic drift which makes the whole process an unfoldment, or differentiation, or concretion of what some are pleased to call God. In the new language, borrowed from contemporary science, we find the same mediaeval dogma that "all is well with the world," though the world has now become the object of interest, rather than God. Reality is of one piece, the actualization of one eternal system. The language may be mathematical instead of theological, but the substance is the same. The tragic dualism between the ethical order and the natural order, which Huxley felt so poignantly, does not trouble the would-be scientific philosopher or philosophizing scientist today. The cosmic equations fill him with cosmic emotion which becomes a substitute for religion. If the scientific spectre of entropy points an ominous finger towards "heat-death" as the goal of all things, an optimistic scientist welcomes this too into the evolutionary plot: "I would be more content that the universe should accomplish some great scheme of evolution, and, having achieved whatever may be achieved, lapse back into chaotic

changelessness, than that its purpose should be banalized by a continual repetition.'"[40] We may ask, what is this great scheme of evolution? Whence did it come? Can we be so sure that it is being achieved? And what will become of it, if the world returns to chaos?

We turn with relief from this soft idealized naturalism of today to the old hard naturalism[41] which says that nature, as the play of the physical forces which we observe, is indifferent to progress, that it has no concern for the advance in favored parts in its course of change; that it is no more evolution than devolution; that it undoes, with the same indifference as it tolerates for a season, the emergent patterns of matter, life and mind; that, taken at large, it displays no purpose in its transformations, though with our human bias we may with judicious selection read into it a progression towards—ourselves. But if we select a route of change of which we are the end and dream of infinite development, we are reminded by unescapable evidence that the whole history of human civilization, whatever achievements it may make on this little planet, is at the mercy of the impartial forces of nature, which in the vicissitudes of time will resolve humanity with all its works into the milieu whence it came, blotting out all remembrance thereof. Such a fate was appalling to the genius who established evolution as a scientific point of view: "Believing as I do that man in the distant future will be a far more perfect creature than he now is, it is an intolerable thought that he and all other sentient creatures are doomed to complete annihilation after such long-continued slow progress.'"[41a]

Nature—conceived in isolation from spirit—is indifferent to individuals and their hopes. It offers no goal except dust and ashes. From any naturalistic point of view, life is a tragedy, the universe is a tragedy. Whether you conceive nature in mental or material terms, the tragedy is the same. Science holds out no hope

of an infinite development, an unlimited perfectibility. Nature passes through its cycles of change, indifferent to the flowers that may have emerged from its crust in some favored corner, and in due time returns to the chaos whence it came. It matters not whether we conceive nature as one great cycle or as many cycles, successive or overlapping in their span, the cycle runs its course, be the span ever so long, and (what matters most to us) our own life cycle runs its course in an incredibly short time. Nature is not the smooth running course of specious philosophies. From the point of view of higher development, nature is a series of catastrophes in which the later emergents lead a precarious existence in the pulsations of the crust of a planet and the pulsations of a star. It is a vain illusion—the product of the will to believe—that nature as such possesses any urge towards progress. Nature is indifferent to the forms that emerge out of its womb. It tolerates them blindly for a season and then unwittingly destroys them and owns them no more. Its law of survival means merely that what is adapted to the conditions survives while the conditions endure. Nature is no respecter of quality other than the ability to survive. When man with his science has succumbed in his unequal struggle with the elements, lower organisms will still survive for a season, until they too succumb, and mortal life is vanquished by immortal death.

There is no legerdemain, no magic formula, by which we can escape from nature. Philosophers have tried to banish nature to the realm of fairy land by some trick of dialectic. They have told us that nature and its laws are merely phenomena; that our mind makes nature; that all its ages and all its vastnesses are the product of our imagination; that mind alone exists, and that the sensible world of earth and stars is but a projected shadow of mind, a dream of a philosopher's imagination. But nature silently mocks the dreamers and converts them into

fancies of other dreamers, until it engulfs the dreamers and their fancies in its relentless course. We are events in the course of nature. We cannot escape from its iron grip by idle speculation. To translate nature into a dream is not emancipation from nature. It is merely another and incredible form of naturalism, begotten of the will to believe. For if nature is nothing but the expression of mind, the tragedy of nature is the tragedy of mind. A pancosmic idealism is merely an inverted naturalism, for if nature is merely the objectification of mind, then mind is nothing but the subjective feeling of matter. Mind, having emerged as a stage in nature, retrospectively imagines itself the maker of nature.

From any naturalistic point of view, however sugared with sentiment, whether disguised as theological dogma or as romantic philosophy, life spells futility, defeat. If we look to nature for the realization of ideals, we must be impressed with its failure. In the gentle melancholy of the sheltered hearth we may reflect with Tennyson:

> For why is all around us here
> As if some lesser god had made the world,
> But had not force to shape it as he would?

But if we are caught, with Oedipus, in the net of blind circumstance and confront the ruin of our hopes, we may cry out in the anguish of our soul:

> If one should dream that such a world began
> In some slow devil's heart, that hated man,
> Who should deny him?[42]

Life is altogether just a false seeming. If, however, we recognize that the world is not altogether bad, we may conclude with Zarathustra and Plato's *Laws* that, even though creation is the work of a good spirit, yet is there also an evil spirit in the world, producing the malicious workings of nature and ever striving to defeat the good. But such views are unduly coloured by our emotions. It is not necessary to assume an evil cosmic spirit which intentionally works to frustrate our ideals, though there

are evil minds in human relations. The tragedy is that nature is indifferent to the individual and his aspirations. It goes its course blindly, unmindful of man. By the gift of reason and science we may control nature in a limited way for a season. But death soon claims us nevertheless and will in the course of time claim the race.

From the individual point of view the universe is tragedy. In the end nothing is real except individuals, and nothing matters except individuals, unless it be better individuals. But nature is indifferent to the life of individuals. It is a dance of death. We may not feel concerned with the clashing of blind forces, the ceaseless doing and undoing, on the level of inorganic nature. We may view with a calm mind the ruthless struggle for existence among plants and animals, and even eulogize it as providence. Yet we cannot, unless we are devoid of imagination and sympathy, be indifferent to the human struggle. At best, without ulterior hopes which have no warrant in nature, individual human life is tragic. This must be so to anyone who reflects upon life. Most human lives are drab and lack inspiration of ideals. To strive for perfection means failure. Life is at best a fragmentary thing. Those who have been most sincere in the service of an ideal have confessed their defeat in this human existence. And in the course of time nature will blot out man and his attainments.

If we measure life in terms of happiness, it is no less tragic. Happiness cannot be the goal of nature, for life is mostly pain. "Grief is the common texture of life," observed the ancient Homer. The joys are fleeting and "dashed with pain." When absorbed in simple animal satisfaction we may rest in the present, but only for a moment. All animal satisfactions are circular and the craving with its pain returns. To a reflective being, who looks before and after, and "pines for what is not,"[43] the happiest moment is always tinged with sadness and "but to think is to be full of sorrow."[43a] We may hurry

faster and faster—on trains, automobiles, airplanes—to escape from trouble, but we do not thus escape from ourselves. The spectre of care returns. We may immerse ourselves for a while in the pleasures of animal love or in the striving for fame or power or wealth, but in the end we are overtaken with the sense of futility, and the ghost of emptiness haunts us. We may not often be saddened by thought, because we do not often think. Callousness to sympathy may save us from poignant pain. But do we therefore want to become thoughtless and callous? To seek escape in not thinking is to miss even the fleeting significance of life. Our choicest moments are indeed those which are touched with the beauty of contemplation, though the moment be brief and the light fade into the grey of night. Better, even so, to be sad with Plato than to "be a pig satisfied."

Our social order seems indeed bent upon killing the imagination, the poet within us, and to reduce life to dull routine. Life is mostly disillusionment. In the morning of life we issue forth with the gift of fancy to make the world a fairy land. The world has the freshness of novelty and we are eager to be initiated into its mystery, but we are hushed and discouraged by the stupid world of convention which has long ago lost its zest. In youth love clothes the world with romance, and we wait for great adventure, but the sordid cares of the world kill the romance. The flower of fancy wilts in the heat of the day. We still seem to be waiting for something. But we forget what we are waiting for. We hurry on faster and faster, until the disillusionment is complete, and we discover that we wait for—death, fortunate if in retrospect we can recall some moment of love, some glimpse of beauty.

The naturalistic view has come to permeate our life. Wordsworth complained that "the world is too much with us." But science has made the world vastly more absorbing. New ranges of eye and ear have been opened to us. Humanity is ever increasing its speed of living,

and craves more speed. Art and literature, which are the mirrors of life, reflect the kaleidoscopic character of our world and our absorption in the flesh. Science has brought human beings closer together by new inventions, and made them more sensitive to one another's misery than ever before. Sympathetic souls, mindful of the common tragedy, would make the conditions of life more endurable. Sentimentalists dream of a scientific millennium when disease, squalor and misery shall be banished from the earth, forgetful of the innate selfishness and blindness of human beings. No doubt science has greatly increased our mastery of nature. It has also vastly enlarged our horizon of this world. It has opened up great vistas into the past, and it has revealed the immensity of the universe to us. It is no wonder that we are absorbed in the passing show. Nature has come to seem self-sufficient. Religion itself has become humanistic and naturalistic. But science only exhibits the orgy of ceaseless change in nature on a vast scale. It furnishes no key to its meaning. Nor can all the palliatives of scientific optimism and humanistic ethics allay our restlessness or banish our tragic sense of failure. The soul asks for bread and they give it a stone.

Naturalistic optimism has no remedy against the tragic mystery of death. The Prometheus of Aeschylus gave man "blind hopes" as "a medicine against death." But the blind hopes of our ancestors have lost their power. The drift of science has been to destroy the paradises which imagination has created as a compensation after death for the ills of this life. This little life is generally felt to be the be-all and the end-all, though we still perform funeral ceremonies. We have banished the consciousness of an after-reckoning. In this respect we may seem more merciful to

> Men of the common rout
> That wandering loose about,
> Grow up and perish as the summer fly,
> Heads without name, no more remembered."

The old theology consigned the vast mass to eternal torment. Only the "solemnly elected" had anything to which they could look forward. But though scepticism may banish the ghosts of theological dogmas, it cannot banish the tragic fact of death. Though we dope men with illusions while they live and with drugs while they die, the shadow of death ever hangs over life. We are but denizens of this earth for a brief moment in the dance of the stars. Whatever be the span of the life of man, he is a transient. "Man that is born of a woman is of a few days, and full of trouble. He cometh forth like a flower and is cut down; he fleeth also as a shadow and continueth not." To die in the bloom of hope is tragedy. To live long is to survive one's friends. Death destroys the milieu in which our affections are rooted and leaves us but a ghost-like wraith of life.

Nature cannot save its choicest flowers from the fate of death. To the poetically sensitive, death tinges the universe with a sense of sadness and futility. It has been said that every animal death is a tragedy. This is true of all death in the order of nature, for death means the destruction of the individual. We may be but bubbles; and the eternal Sáki may blow new bubbles, world without end, but each bubble is an individual life with its own unique significance. Where are the flowers of yesteryear? There may be new flowers, but something beautiful has perished, not to return.

> The rainbow comes and goes
> And lovely is the rose. . . .
> But yet I know where'er I go
> That there hath passed a beauty from the earth.[45]

Life is a becoming and a vanishing. It may cumulate for a while like a snowball, but like a snowball it soon melts. It is always in transition. The mother weeps over the transformation of her lovely child; the charm of youth passes into the prosiness of manhood, and manhood stealthily passes into old age. At each stage a beauty perishes, and at last the man. What compensation does na-

ture furnish? The naturalistic view is summed up with awful irony by Hamlet: "We fat all things else to fat ourselves, and we fat ourselves for maggots."

You say, death is the common lot. Why make so much of it? But its being common is just the tragedy of it. It respects no quality of life. It destroys the noble and the ignoble alike. It cuts short our endeavor when we might see light. It robs love of its fulfilment. However common death may be, it is a solemn and lone venture to the one that dies. Of all the multitudes who travel that road, each one must face the final mystery alone.

> The nearest friends can go
> With anyone to death, comes so far short
> That they might as well not try to go at all.
> No, from the time one is sick to death
> One is alone, and he dies more alone.[46]

And death is a tragic frustration to the love that remains, who wishes in vain for "the touch of a vanished hand." There is the terrible emptiness—never to be filled,

> The sweeping up the heart,
> And putting love away
> We shall not want to use again
> Until eternity.[47]

Life is a pathetic thing. An undertone of sadness runs through all nature. Deep down nature is a vast community of pain which craves sympathy. Who that has imagination can help being touched with pity and yet with a sense of helplessness? I am writing out-of-doors on a day in June.* The sunlight filters through the foliage of elm and maple, whose shadows bend over me and silhouette themselves upon the green sward. The lilacs are in bloom and spread their fragrance upon the gentle breeze, while the hum of honey-laden bees makes music in the air. A silver moth lights silently on my table, moves close to me and remains. I wonder why it has forsaken its sisters and the flowers. I touch gently its soft silken

* This paragraph was written in Northfield, Minnesota. The book was written in Los Angeles at the University Club.

wings, reticulate with marvelous geometrical patterns. I shift from shadow to light and back again, but it remains in confiding quietude. What do I know about the feelings of a sister moth? Does it want pity since its beauty is so brief? Whatever brings it here, and I shall never know, it is my companion and my heart goes out to it. A beautiful young girl, just blossoming into womanhood, with swelling breasts and dreamy eyes, comes and sits silently near me. She says nothing but looks wistfully into the distance of nature—the distance of the future. What does she mean? She could not say, but the tide of life is rising within her innocent body and her fancy is weaving dreams of her heart's desire. In the vastness she is facing, she is feeling the need of sympathy, she knows not why. She is waiting for me to look up and give her just a smile from my heart, and then she goes away. The moth and the girl have arrived by diverse routes over a long distance of time. No mere chance could have brought them to this marvelous perfection. They are the creations of the fancy of some spirit that works with the filmy texture of chaos. They are pathetically beautiful in their mortality. What can I do for them except to pity them—I who am also a transient wave on the fathomless deep? I took the moth tenderly and put it in a secluded place. The next day it was dead. The girl went forth to meet the joys and sorrows which for a brief time are a woman's share. Both the moth and the girl felt a change coming which they could not comprehend. Both were longing unconsciously for the flame which consumes in an ecstasy of pain. Oh! the pity of it that our heritage is pain, that to be born is painful, to live is painful and to die is painful, that the silver lining of joy is so rare and so brief. It is sweet to love and to be loved. All love is lovely when it is idealized by imagination and freed from carnal desire; and the more spiritualized, the lovelier the communion of love becomes. But the sad thought steals into the moment of joy: it cannot last.

I would not have you think that life must be a seamless robe of sorrow. Life must not always be overlaid with "the pale cast of thought." It requires moments of abandon to play as well as to reflection. Life must have its bright colors as well as its somber shades. It must not always be dressed in sable. It could not be sane and wholesome, if it were always sad. There must be the lyric sound of laughter as well as gentle melancholy. Life requires contrasts to be significant. Joy is precious because of sorrow. The rainbow smiles in the face of the storm. The shadow is ever moving across the sunshine—blotting out the sun—and so we love the sun. The destructive pageantry of nature may itself inspire a sublime calm in a noble soul. Life becomes pathetically beautiful because of death. Pain is not always brutal pain. In a beautiful soul pain may be sublimated. Suffering may not be just a mystery. It may be a revelation. To the noble in spirit, with love and creative imagination, it may suffuse life and history with a new light.[48] All beauty is born in anguish. There can be no creation, no genuine insight without suffering. Soul, love, creative imagination itself, are born in pain. In the crucible of the great human catastrophes the great idealisms have emerged, however great the tragedy to those that have gone under. In our finite existence the harmony of the creative life must have its undertone of sorrow—the tragic sense of failure to realize the vision of one's soul. Even when imagination transforms suffering into beauty, the suffering colours the texture of life. Pain must ever for us be an ingredient in beauty.

Yet pain by itself is not beautiful; it is ugly. And most pain is futile pain—blind sorrow that has no light of hope, no compensation. Instead of purifying, it makes one hard and bitter. Most pain in nature is unmitigated by fancy and love. The pain which is hardest to bear is that which comes from the blind selfishness of human beings. More tragic than being on the rack of nature—

infinitely more tragic—is the pain of him who brings light and healing but is refused—the tragedy of being crucified by a humanity he loves more than himself, but which will not see and, being blind, cannot see. It was such pain that blotted out the sun for the noblest of men, and made him cry in the anguish of his soul: "My God, my God, why hast thou forsaken me?"

Yet his suffering was tragically beautiful, because it was suffused with infinite love. Beauty is the distilled essence of love—love which suffers and aspires. Suffering is beautiful in those rare moments when it is made tender by love and idealized by imagination; when the temporal striving and anguish are touched with eternity. Then defeat and death are no longer black tragedy, but beautiful tragedy. But such joy cannot come from nature. It must come from within. The nightingale must sing in our own souls. This joy is not a flight from pain, but a conquest, a sublimation of pain. We cannot fly from pain, because we cannot fly from ourselves. "The man who flees," as Hegel says, "is not yet free: in fleeing he is still conditioned by that from which he flees." But whence is the soul to get this source of joy which can give eternal beauty to pain? Nature knows nothing of such a source. Nature is blind tragedy, without salvation. The exuberance of animal life cannot last, and for a thinking being, it is shot through with the pain of reflection. Mysticism is an escape for a moment, but we wake again to the tragic reality of life. We require a source of joy which is not of this world, if we are to transform the suffering of this world into "a thing of beauty" and "a joy forever."

* * *

The rebirth of nature into the life of spirit is a painful deliverance. It is a false saying that nature rises to higher things by its own impulse. Nothing can rise higher than itself except by grace from above. The higher or-

ganization does not emerge from the lower unaided. It requires an impetus from a higher level. There is no *nisus,* no tendency, in mere nature from the lower to the higher. From any naturalistic point of view, nature, with all its magnificent pageantry, is futile and meaningless —doing and undoing its work like a child building castles of sand on the seashore. It is the love of the higher for the lower that draws the lower upward by infusing a striving for the higher. Whatever is of this world perishes with the changes and chances of this world. Spirit, though it has emerged in this world, has no permanent abiding place in this world. It is not of the world and the world owns it not. It is impossible to regard the universe as divine and to put our trust in it. Religion cannot be just cosmic emotion.

The dogma that the world is a perfectly ordered whole in which every part ministers perfectly to every other, the lower to the higher and everything to the whole, is a fiction without foundation in fact. A great part of the world as we see it is surely the result of the sea drift of mechanical forces. The ancients, seeing death and tragedy under the moon, conjectured that the world of the stars must be perfect. "The heavens declare the glory of God." But we know that the stars are part of the dance of change. It is in vain to look for perfection in them. They go their course indifferent to our ideals—to meet their doom of extinction. The starry thyrsus bearers disappear in the night when their flame has flickered out, themselves consumed. If we take a cycle of nature, though it may be aesthetically appealing, yet as a cycle it is self-defeating. Why suppose that the world has any meaning in itself, any claim to perfection? But nature cannot be just chance. In nature there is measure, number, form which our intelligence can in part grasp and admire. The universe is not a perfect whole, but there is evidence of whole-making. Nature must have some kinship to spirit, even though it is not

spirit. Else how could spirit see meaning and beauty in nature? Spirit itself emerges in nature, even though it is not of nature and though nature owns it not. It is because creative spirit permeates our world that nature, through long preparation in the dark womb of time, lends itself to be the home and instrument of spirit. Spirit could not emerge in nature, if nature had not been guided towards the creation of spirit.

I deem it a divine inspiration that a mighty spirit broods benignantly over chaos and that creation is the child. In the beginning there was chaos—waves of the deep in continual clashing and futile strife. Into this wild sea of chaos God breathed waves of form—waves of healing love and constructive fancy.* The flux began taking on measure and rhythm, and the measured pulses of the dark were grouped into patterns with distinctive qualities. New waves of form produced new groupings with new qualities, according to the capacity of the flux to take on structure. At length part of the flux took on life, and at great length a very small portion of nature, by long preparation, lent itself to the incarnation of spirit. It is divine to incarnate patterns in nature, but it is diviner still to incarnate spirit, and infinitely more painful. In the creation of spirit, the great Spirit has established a community between itself and its creation. The creator has created creators who can in some measure, however confused, share in creation. However babbling the response of spirit, it relieves the infinite loneliness of nature.

My picture of creation, suggested by an ancient myth, is dramatic to aid our imagination. It is impossible to describe the chaos out of which spirit creates the world. We can know it only as it takes on form and by its forms. Even error is in part form. We call that formless which does not have the form which we seek. But we are

* This may be taken as a poetic expression of Schrödinger's "wave mechanics."

familiar with degrees of disorder in our world, and we can make the abstraction of a general disorder, the absence of meaning. If we cannot conceive chaos in the abstract, neither can we conceive spirit in the abstract—a spirit which does not create—for it is of the very essence of spirit to create. We are obliged, therefore, to think of creation as an eternal process. We must think of the creative Spirit as present everywhere and always as the field in which everything lives—transfusing everything and transforming it as the finite permits. Yet the dualism of the ancient myth remains, whether we use the language of *Genesis* or of the *Timaeus*. We can understand our own life and the universe better, if we think of reality as consisting of two realms—a realm of matter and a realm of spirit. It is the field of spirit which overlaps. It interpenetrates the realm of matter. Without the guidance of spirit the realm of matter would distribute itself mechanically. There would be no number, no measure in nature. These are the gift of spirit. But nature has ever its own plurality and restlessness. Its inertia sets limits to the constructiveness of spirit. The dualism, it is true, is projected from our human experience, but it helps us to gain insight into nature's tragic indifference to advance. The womb of chaos does not beget the beautiful forms of material structure. It does not furnish the pattern of the atom or the geometry of the crystal. It does not beget life nor guide the routes of life toward sense, feeling and reason. But the wild waves of chaos are tamed by Spirit into rhythms and patterns for a season, be it the brief span of a life or the span of a star. Creation is the reclaiming, the moulding, the persuasion of chaos into forms of beauty.

The divine spirit travaileth throughout all the ages and worlds to bring spirit to fruition and freedom. God is not limited to one cycle of nature for his creative activity. As the earthly year brings recurrent cycles, so does the cosmic year; and as the seasons of change vary

on different parts of the earth's surface, so that summer in one place may co-exist with winter in another, so in the universe at large all seasons of development must be compresent. Everywhere the pervasive Spirit is silently and graciously sorting the confused skein of nature and weaving it into marvelous patterns and superpatterns. We can feel imaginatively the

> Humming of the god-flung
> Shuttles of a loom[49]

Divine genius is as wide as the artistry of the universe, yet revealed in the minutest structures of nature. It expands in the rose bud and in the imagination of the poet. Everywhere the eternal themes are repeated with variations. In material evolution there appears to be uniformity. But even though material cycles with their framework should repeat themselves under similar conditions, the development of spirit never repeats itself, for spirit has initiative of its own and establishes conditions of its own. It is not a mere function of the conditions of nature. Hence there is infinite variety in the creativeness of spirit. It may follow certain routes in its style of expression, but it is not bound by routes. It can create new styles.

All creation of beauty, all rise to higher levels of creativeness, requires grace, and this operates through individuals. In the community of spiritual creativeness there is a reciprocal relation of the finite spirit with the infinite Spirit. Creation in nature is unilateral. It is a process from above. Matter merely lends itself to creation. But when life has arrived at the stage of spirit there is finite initiative of creativeness. It is given to finite spirit to create for itself. It experiments to discover a form which shall express the meaning of things from its own point of view. In this experimentation it is not isolated, it does not work alone: it has the inspiration of the infinite Spirit; and when it creates sincerely and earnestly, it is wiser than it knows. It has intima-

tions, as it is prepared, of a larger, fuller meaning. To express fully this meaning would be to express the eternal meaning, but it would still be to express it as the finite individual's own meaning, coloured by his life and his experience. In some way, we may believe, there is a spiritual community of creativeness through all the worlds in the medium of Spirit. All the patterns of energy are immanent somehow in this spiritual field and have their characteristic effect in due season when the conditions are prepared. But our limitation of feeling and knowledge is great, and we cannot understand how that may be. Whatever be the community, social or cosmic, every individual must by the grace of God make his own venture, learn from his own suffering, and create, in his own individual way, the beauty as he sees it.

The drama and tragedy of creation is rooted in its birth, for it is born out of eternal pity, striving to beget order in chaos, and, however beautiful the offspring, the chaos, the darkness, the blindness is never entirely subdued in the realm of nature. There is much chaos, much laziness, to overcome in us too—the reminder of our mortal birth. There is the wistful pain of ideal longing. There is the striving of the spirit to conquer the discord in us. But there is always the past with its indifference to advance, the inheritance of chaos through material and biological evolution. Hence all progress is bought with suffering. It is only through pain that spirit can emancipate itself from its bondage to the past and seek salvation in new forms of sympathy, appreciation and cooperation, for in that direction lies fuller life. The new form of realization cannot come without struggle; and the individual will not strive unless he feels the pain of discomfort in things as they are. Only suffering can overcome the indolence of nature. But the pain and the will to achieve are futile except for the benign Spirit which broods over us, permeates us with its genius and grace, and makes us wiser than we know and greater

than we are. The divine Spirit always permeates everything, but it is only where there is the will to respond that grace becomes efficient in the individual life. This is the mystery of creation and salvation. All advance is born from the fructification of the natural order by a spiritual order which gives it meaning and value. Without this spiritual order there would be no natural order. It is the immanence of the life of Spirit which keeps nature from running its fate to eternal death and makes it rise to new levels and beautiful patterns. It is the life of Spirit which weaves the community of nature and transforms its strife into a drama, however tragic.

We must find the key to the meaning of reality in our own most significant experience—not in our moments of indolent dreaming when we yield to the laziness of nature within us and picture idle paradises, but in the moments of creative effort to re-shape an amorphous material into new forms, be it the reconstruction of our chaotic sense impressions into hypotheses, or the remoulding of matter into expressions of beauty, or the rebuilding of our chaotic human life into patterns of love and justice. It is in this consciousness of creative realization that we have our only intimate knowledge of causality. The rest is projection. As we work to re-create an indifferent world into patterns of meaning, so we must think of the universal Spirit as forming the indifferent matter of nature, including ourselves, into patterns of beauty, as far as the wilfulness of nature permits, until by long stages this material in rare instances lends itself to the incarnation of spirit. We must conceive the process of creation, not as an attempt, and a tragic failure, to make a perfect world, but as an effort of infinite patience to create spiritual value in the world. Spirit is the life and light of the world. It alone has life and form in itself; and its grand effort is to spiritualize the world, so far as its laziness permits.

We should not despise the material world. It is not

the work of an evil spirit. It is not an illusion begotten of ignorance and sinful desire. There is much that appeals to our intelligence and sense of beauty in the universe. In spite of the darkness and contingency within it, it reveals marvelous law and pattern. When nature is intuited as imbued with spirit, it is not a mere realm of shadows. It is a world of creative genius, hence it suggests structure to the creative mind. Even on the lower levels of nature, matter has been spiritualized into rhythm and form. Chaos has been tamed by measure. The world is lovely when it reveals the language of spirit to the creative mind. To understand and to appreciate is to create, be it in art or nature. The great Spirit who creates form in nature reveals it only to creative spirit. It is for this that the great Spirit labors and waits—that in the fullness of time he may incarnate into nature a creative mind which may enter into sympathy with the architecture of nature, and by re-creating nature in imaginative expression enter into rapport, however imperfectly, with the supreme creative Spirit. In community with the pervasive universal Spirit we create anew, in the matrix of nature, the world which we perceive. And for us this spiritual creativeness, with its organization and idealization of nature, is the most precious fruit of the process of world-making, and the only part that ultimately matters.

The material world is an instrument on which he that knows can discourse excellent music. The instrument goes to pieces, but the spirit of music remains. The world is a canvas upon which the cosmic artist spreads his sunsets. The canvas decays and the sun fades, but the design in the soul of the artist remains; and in the ages he will build new instruments for his music, new canvases for his pictures. The significance of the cosmic process is just that, through the guidance of spirit, it may for a moment embody form in the dance of change, express the eternal in the course of time; and that it may in recipro-

cal response to mind in the universe, in the course of the ages incarnate a mind which can creatively perceive form. The matter goes the way of the world; but though everything passes, the meaning is eternal. "The form remains, the function never dies";[50] for it is of spirit and lives in the spirit.

The light which sheds meaning on this obscure changing world is the radiation of spirit. This light cannot be given by nature. It can flash out only in the depths of a noble personality where spirit with spirit doth meet. It is the rare gift of a beautiful mind to bring to birth beautiful expression in others; and in our devoted expression of beauty, we worship best the Spirit of beauty. It is given to us in rare moments, when we work sincerely, in loyalty to the Spirit of creation, to share in the eternal joy of creation and to send our souls on the wings of song into the Spirit of the whole. To divinely sensitive souls, Spirit *is* manifest in nature. In the solitude of the starry night, of the giant forests, of the majestic mountains, of the mystic prairie, of the unlimited sea, a silence (which is not stillness) speaks to silence, the alone communes with the alone. Divine grace surrounds us like the air. It works everywhere. It clothes the naked earth with the charm of green grass and flowers. It makes things graceful—the child, the animal, in their play. It sings in the heart of the pure, but only when it has been touched with pain. Hence beauty is always tinted with melancholy. All beauty makes me sad with a sweet inexpressible sadness. But in a beautiful soul the sadness is itself beautiful. The pain of creation merges in the joy of creation.

But our admiration of nature must not blind us to the indifference and primitive pluralism within it. Strictly, it is not nature which the poet within us admires. It is the struggle of spirit to express itself in nature which we feel, when this Spirit touches our spirit. It is true that the pervasive genius of Spirit has tamed a great deal of

chaos into marvelous structure. Yet the physical world remains the scene of gigantic conflict. We admire the tranquillity of the starry heavens. But the placid stars which we contemplate with aesthetic delight are vast furnaces of destruction, in which matter itself, with whatever of structure may persist, is being consumed to produce radiation—the last and most tenuous stage of nature—still rhythmic because it is born out of a matter which is endowed with measure and pattern. What pleases us is a mass effect—at vast distances from the orgy of destruction—to which our selective organs are attuned. Light is the last testament of the death of organization in nature. "Colours are the deeds and sufferings of light," says Goethe. They are the deeds and sufferings of light in those who enjoy them.

We must not forget that the Spirit which works in the restless forces of nature has been able to overcome their indifference to life in only an insignificant portion of matter. The vast part of the universe which we see as stars is incapable of life, though in its dissolution it may minister to life. The universe is far from being a living organism, alive in every part, though a living Spirit operates within it. On the level of life, again, we find a great deal of untamed restlessness. The realm of life is not so peaceful as it seems when we contemplate a rural landscape from a distance. From its lowest level of organization to the highest, life is an internecine struggle for survival, where love, as parental instinct, only occasionally and intermittently softens the tragedy. Humanity with its science is no exception to the struggle. Science itself, in the chaos of human passions, often becomes an engine of destruction instead of a means of cooperation for greater welfare, though over long distances of time we can see faintly the harmonizing work of love.

If love—imaginative, constructive love—is the source of creation, and if love—the disinterested creative devo-

tion to an ideal harmony to be incarnated in life—is the end of creation, then the universal Spirit of creation has succeeded in only a few instances in the vastness of nature in realizing its purpose—a Jesus of Nazareth, a St. Francis of Assisi, with a small company of noble souls devoted to the healing truth which sets men free. The tragic beauty of such lives of love and meekness shows the wide gulf between the natural order and the spiritual order. Nor is there any sign that their lot will be less tragic. While society will soothe its conscience by building monuments to the prophets who are long dead, it will with unerring instinct crucify those that are sent. The servant of a higher ideal will always be despised and rejected of men. Prometheus will always be on the rack, for he is always bringing fire from heaven; and to the gods of things as they are he is always a criminal. Yet the Prometheus who suffers willingly for the truth and who forgives his enemies—not he who curses his enemies—will bring the light of love, understanding and freedom to a larger number, though always pitifully small, who have the will to be free and seek the grace to be free.

It is the tragedy of creation—the ultimate tragedy—that many are called but few are chosen. This tragedy is inherent in the very nature of creation. For creation is the transformation of chaos—the blindness, the wilfulness which is inherent in nature. In all monistic systems of thought, God becomes responsible for the failure of creation. But for us the failure is not a limitation in the creative Spirit, but in the material with which Spirit works. God is justified, the responsibility lies with the individual, with the indifference of nature, at all stages of creation, to that which is higher. When we recognize the complexity of the conditions of creation, we can realize, in a small measure, the stupendous undertaking, in the changes and chances of this world, of bringing to incarnation and freedom the pure life of spirit, the life of

imaginative love, which can respond, soul for soul, to the supreme Spirit, the Spirit of wisdom and beauty, of love and atonement. We can feel pity for the tragic failure of nature, including the failure of man, because of the blindness to be overcome, because of the long trail of suffering which the birth of spirit entails; and we are moved to admiration for the few who have ventured, by faith where they could not see, to sacrifice themselves and to go under in the struggle to bring harmony into a disordered world. All is not well with the world, but at least it offers the opportunity of grand heroism, of sublime loyalty; and in such high moments spirit conquers the world.

* * *

In this mortal world, the individual goes under in the struggle. But if he has caught a glimpse of eternal meaning in the flux, and realized the vision of beauty even for a moment he has proved himself superior to the course of nature. It is in his very tragedy that he takes on a divine quality. His suffering and his pity open up a vista into the meaning of life—the meaning of God. It cannot be that a soul, thus devoted to the service of the eternal, shall altogether die. Since God is creative Spirit, the conservation, as well as the bringing to birth of spirit, must be his divine concern. If the realization of spirit is of supreme significance to the eternal Spirit, then this Spirit must save within the realm of spirit, though not in the world, whatever is significant of spirit. God must be a saviour as well as a creator. Our minds have been pre-occupied in admiring the architect. But the genius of architect in a chaotic, changing world is futile without a saviour. The function of architect is the formal cause, but the function of saviour is the final cause of the process. God creates in order to save.

Nature is not an end in itself. It is but an instrument for realizing spirit. God can reveal beauty in a passing world, but God cannot save the world from mortality.

The world, with all that it includes, must perish. God can tame chaos into rhythm and periods, but he cannot make nature immortal. It carries the seed of death in it. Only spirit is immortal and the forms in which spirit expresses itself. Life is a compromise of form with change, and death reclaims its own—but only its own; it cannot claim what belongs to spirit. There is always the tragedy that our existence, born of eternal Spirit and mortal chaos, must yield what is mortal to mortality, but the essence, which is the contribution of Spirit, remains in the Spirit. In a temporal world, God cannot save his incarnation of beauty from death, but God can conserve the form of beauty in his mind and reincarnate it in matter as the opportunity arises. Hence the perennial resurrection of beauty though it dies. Whatever is of this world perishes, but that which is of the eternal world is immortal.

The only way in which spirit can be conserved is in the life of the eternal Spirit. The values of spirit cannot be conserved in the world, for the world goes its course, indifferent to spiritual values. It recks nothing of destroying the works of spirit. But through the guidance of spirit nature furnishes unwittingly the temporary body and stage for spirit. And spirit may endow the mortality of nature with immortal meaning. Even the indifference of the world, its precariousness and tragedy, can become the means for the development of spirit—a challenge to its inventiveness, its venturesomeness, its courage, its will to attain. Through the temporal struggle and the anguish of soul comes the grace which gives meaning and value to life—the blossoming of beauty, the rainbow of hope, the tenderness of love. The effort and the pain to transform life into spiritual unity, to create personality, is also the condition of the persistence of personality. In the fire of suffering love, the dross of earthly passion is sublimated and the diverse elements of life are consolidated into an enduring character.

The longing for immortality in some sense is of the

very essence of spirit. To think of immortality as the conservation of the pattern, the eternal meaning of creation, in the eternal Spirit of creativeness, is a beautiful thought. It is the only immortality which creativeness in nature can have. When the fabric of nature is shattered to bits, the meaning remains and the cosmic artist can repeat the process of creation. There must be infinite satisfaction in this ability to experiment again and again to mould a world nearer the soul's desire. Perhaps the matter in nature like the matter in us may become more plastic. Perhaps the suffering of nature is not altogether lost but may make the material, even though it reverts to the primitive, a little less wilful, here and there. But there is the tragedy that, whatever may be the outcome of each experiment, the individual perishes.

Is it even so on the plane of spirit? So far as spirit is part of nature, functioning through an organism which is the product of a long evolution of nature, spirit must share the mortality of nature. But Spirit is not a mere function of nature. It exists eternally in its own right. It is an energy which transforms nature, which gives direction to the course of nature, guiding nature towards the incarnation of life and mind, making the course of nature significant. The formative Spirit of nature must have an independent status. And if the final cause of creation is the incarnation of spirit, then it is reasonable to believe that the great creative Spirit will somehow save the life of spirit, so far as it is significant within the economy of the divine life, and that the creative adventure of finite spirit will somehow go on in the realm of universal Spirit.

If the goal of creation with all its travail is to produce creative spirit and if nature is significant only through its value for spirit—as the instrument and the eternal delight of spirit—then if spirit perishes with nature, nature loses its reason for existence, and the experiment of creation becomes futile. The life of spirit can have

no significance for nature. It is an infant crying in the night with no answer but the echo of its own cry and the darkness. If the Creator is just a cosmic mathematician, blowing bubbles, then creation is just an interesting sport. But if God is not just a creator but a saviour, as we, in our deepest intuition, feel that he is, then his concern, after infinite pain of bringing creation to fruition in spirit, will be to salvage spirit and to encourage spirit. Then the enormous wastage and tragedy of creation will not be entirely in vain. As society tries, within its limitations, to conserve and advance the spirit of culture, making immortal, so far as it can, the significant fruits of spirit—its poetry, its music, its art, its laws and institutions—so the eternal Spirit must aim to conserve and advance the life of significant spirit.

We cannot escape the truth that spirit has a significance and status different from the course of nature. Spirit alone has initiative of creativeness. It is not just the thrall of nature, but it strives to make over the face of nature and to alter its course in the direction of the demands of spirit. While in this mortal existence it lives the life of an organism, yet is it not just a function of the body, but is an independent energy with a field of its own which can control the activities of the body in the service of spiritual purposes. And through the activities of the body it can transform to a considerable degree the external agencies of nature. When the mental field dominates the body with its mechanisms we can truly say with Plotinus that the body is in the soul rather than the soul in the body. It is only when the soul surrenders to the passions of the body that it is in the body. But the mental field is not limited by the body. It stretches out into space and time to live in social fields of sympathy and cooperation, while all the time it has its roots in the infinite life of Spirit from which it draws its sustenance. It is not just part of the routine of nature though it lives in this routine. But through creative thought and the

instruments which it shapes out of matter it gives new direction to the routine of nature at least in its own life. It is not just the product of its past, but it re-creates the past—its own habits and memories and the habits and memories of the race—to meet its needs. Though spirit in this mortal existence must work through the instruments of its body and suffers with the changes in its body, yet it is the high prerogative of spirit to emancipate itself more and more from its material conditions and to use them in the service of its ideals. It does not need to be the slave of the body with its appetites. It does not live by bread alone, but by the inspiration of spiritual achievement. It endures material hardship and privation joyfully that it may gain the values of spirit—the values of goodness, truth and beauty.

The realm of spirit has its own laws. It is not as spirit subject to the laws of nature. While nature carries on a losing game in its activity, spirit grows through activity. It loses itself only to win itself. Instead of losing its energies by spending them, as matter does, it grows richer by spending. If it does not spend its energies, it atrophies and dies. The laws of spirit are not those of nature. They are rather the opposite to those of nature. Spirit makes possible the resurrection of nature itself which otherwise would sink into permanent death, and in fact could never have risen therefrom. Shall there be resurrection of nature and not be the resurrection of spirit? Spirit does not die the death of nature, for spirit is a manifestation of that ultimate energy which gives resurrection to nature. It has, just in so far as it is significant spirit, a share in the eternal; and in the infinite Spirit, it can shape itself such instruments as it requires for the expression of spirit, whatever may be its future destiny. As begotten in the world of mortality it must suffer and die in the world of mortality. As begotten in the spirit it has eternity in the Spirit.

Even now it is given to creative spirit to commune with

creative spirit, the eternal with the eternal, to grasp creatively the form in the flux, to see, however brokenly, the pattern of the passing show, to appreciate the eternity of beauty in the pulsations of time. In purity of soul, we can commune with one another as souls in the great ideal interests of life; and we can cooperate creatively in the eternal striving for truth, beauty and goodness, even though we are bodies and share the flux and passions of this animal existence. And choice souls even now commune with the universal Spirit in the creative sharing of a meaning and beauty which is more than our passing lives, more than the life of nature. Is not this intuition of the eternal even now a recollection of our origin in the life of Spirit and a presentiment of a possible eternal destiny of spirit, if spirit is true to its vocation? Do we not even now in communing with the eternal, in our highest moments, live that life of immortality which transcends time and its vicissitudes? And shall not the creative devotion to the eternal prepare us for a fuller and more enduring life of immortality?

It is not given us to understand how finite spirit persists in the enveloping field of Spirit. We have only a superficial understanding of the urge and development of spirit in this existence. Spirit issues from the unknown into this existence. Its structure carries the accretion of an indefinite past. But the qualities of spirit are not the product of material evolution, for matter does not possess these qualities. That matter has become fitted to be the expression and instrument of spirit must be the work of spirit. It is the soul which is the architect of its body, not the body which is the architect of its soul. Nor is society the creator of the soul, but the soul in its forward urge is the creator of society, because it requires society in order to express and articulate its meaning. The physical body and the spiritual body are alike the expressions and instruments of soul. If the soul has made these instruments, it can make other instruments

as its needs require. The soul does not require the imagery of memory to persist. It has a deeper duration than the fleeting pictures which its fancy creates in our consciousness. These are but passing signs and instruments of its activity. Even now we remember but little of what we live. It is the persistent urge of the soul which gives continuity to the pictures of memory and by its interest makes them meaningful in its realization. The Karma of the soul conserves the deeds of its history. The spiritual pattern of the soul even now owns the past and stretches forward into the future. This spiritual pattern shall persist, even as it has persisted through our various metamorphoses in this existence. Our physical body is always dying and always being repaired. It has no continuity. But the soul carries its destiny within itself. Though truncated by the loss of its material and social expression, it shall "surely bring up" and re-create itself somehow and "go as much farther, and then farther, and farther" by the grace of God. The pattern of an individual personality will complete itself as surely as the pattern of an atom. The soul can only be defeated by its own refusal, not by external circumstances. There is a cosmic harmonics of spirit, as of matter, which saves it from accident and guides it to completion, in accordance with the laws of spirit, when opportunity arrives.

The eternal Spirit of the ages may say: "I cannot give permanency to spirit *in* the world. But I am not of the world, and I shall save what is significant in spirit out of the wreck of the world. If your life is tragic, do I not suffer with you? If you die with me, shall you not also be resurrected with me? For I am the resurrection and life eternal. I cannot take the bitter cup from you. I cannot take away suffering and tragedy from the world. But I can sublime sorrow into a more beautiful and significant life of spirit. I cannot make the world perfect. There is much blindness and wrongness in the world, and 'the immortal conflict' of the higher and the lower must

ever go on. But it is the glory of spirit that it can overcome the world, and I am your helper. With all its evil, and even because of its precariousness, it is the sort of world where, with thought and love and plain heroic courage, something of eternal significance for spirit may be achieved. Not by escape out of the world, but by struggling, suffering, loving in the world, shall you create an enduring structure, a city not built with hands, eternal through the ages. Beauty itself is the interfusion with the finite of the anguish of the love of the eternal; and though this love be three fourths pain it transforms life into the triumphant consciousness of a glorious quest. The cosmic tragedy of bondage and death shall by my grace be transformed into divine harmony."

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O! the mystery of God who gives the light of intelligence, and yet is infinitely beyond our intelligence. We cannot by searching find out God, but through the intimations in the life of creative spirit, we must try to grasp him as we can, for the idea of him must illuminate for us everything else, and without him everything else is meaningless. Weird shapes of God have haunted "thought's wildernesses." Men have thought of God in the image of their own mind, if not of their own body. It must ever be so. Those who have sought an escape from the perplexities of life in the intoxication of a mystic trance, where activity ceases and distinctions disappear, have thought of God as the simple and ineffable fulfillment of their wish. But I believe rather that God is ceaseless, creative activity, and reveals himself in the joy and pain of our noblest endeavor. The mystical experience to be significant must come as the emotional heightening of the creative life.

Those who have valued a fixed and established authority above all other things have thought of God as an im-

mutable will, decreeing eternally the course of history and having no feeling, no pity, for its individual tragedies. But I feel nearer the essence of God when I think of him as "the omnipotence of music" than as the omnipotence of an oriental despot. It is our most precious heritage from the Hebrew prophets that God is a God of love, of infinite compassion; that he is not bound by the fate of the past, but can transform the Karma of the past and make the world anew; that we need not grovel before our sins, for in the fire of repentance he can transform the crimson stain of the soul and make it holy. The Furies of the past shall not haunt us, for he can banish our transgression as far as the east is from the west. He can erase the mark of guilt, leaving only humility and love in our hearts. The evidence of this transformation is no mere emotional elation but the fruits of the spirit—the creative love of justice and kindliness, of truth and beauty, of holiness and reverence.

Those who have been absorbed in formal logic have thought of God as an animated scheme of categories, differentiating his essence according to logical division. It is true that creative thought is sane and orderly, but it has its own logic; it is not bound by our formalism, which is an after-thought and never creates. Those who have admired mathematical pattern and order in nature have thought of God as a supreme mathematician. God does reveal his genius in the patterns and order of nature, but we must not forget that mathematics is our language—a very human language—for stating the abstract aspects of creation as we are able to grasp them. Being a human medium of expression, it is ever in flux, because of our limitation. I do not believe that the supreme Genius of the universe requires a mathematical language for his creativeness, any more than he requires French or English. He creates the form in his material by an insight that only the creator can possess.

Those again who have been enamoured with beauty

have thought of God as the supreme artist. But though beauty is a revelation of God, we must remember that our sense of beauty is conditioned by our human organization and our human experience, that the supreme Genius has no need of our technique, that he is not limited by our styles, that he rather creates "as the bird sings," though with infinite insight. But God is not just a creator. He is a saviour; and for us the function of saviour is as important as that of creator; or rather God's creation is salvation; and the creation of a beautiful soul is infinitely more precious than the creation of a diamond. All the sincere efforts of man to think of God have had their historical importance and suggest something, but they are not all equally relevant to our needs and they are all human—all too human. Yet however human our efforts must be, it is imperative that we should strive to express the meaning which God should have in our experience. For "God is the supreme symbol in which man expresses his destiny, and if that symbol is confused, his life is confused."[51]

Why should we put a premium on thinking of God as fixed, automatic and immobile? It is not this quality that we value most in human experience; and significant human experience—limited though it is—must be our key to the divine. Do we not value a temporal personality like Socrates more than a timeless syllogism? We must indeed conceive of God as eternal and perfect, else creation has no meaning, no worth. If God himself is evolved in the process of creation, what meaning can there be in creation, what *nisus* toward something higher? But eternity is not something separate from time. If God's life is ceaseless activity, everywhere and always, it must have its own time and its own extension, though the soul of this time and extension is indivisible in its unity. Our own soul is indivisible in its temporal and spatial activity, because the soul is the unity and meaning of the whole activity. The symphony is not divided because it

has movement and variety. It could not be a symphony otherwise. The divine eternity is not mere timelessness. Rather it is manifest in transformation like music. The static is death. The eternal is the substance of the passing moments of time and gives direction to the whole life of space.

In the highest religious experience which man has attained, God is conceived as incarnating himself in space and time, laboring, suffering, dying in the tragic struggle to overcome the indifference of nature, within man and outside; yet is he ever eternal and, therefore, the resurrection of spirit in new and higher ideals. In some way we must find the eternal in the temporal, or the temporal has no meaning. The human soul craves a God who bears its sorrows, who has compassion with its needs, who shares with it the process of creation, inspiring creativeness in it as its comrade and friend. It cannot be satisfied with a statuesque God who merely contemplates human history.

Instead of an awful picture of calm power, a stony image in grey, who beholds indifferently the course of a fated world (which theology has given man as God, and then wondered that man did not love it),[52] I think of God as the infinitely sensitive poet who suffers in the death of the beauty which he has created—in the destruction of material beauty, in the death of the flowers, in the death of the helpless animals, but above all in the death of the incarnations of spiritual beauty, because these, having required the greatest pain and having most of the quality of God, must be infinitely dear to him. Shall Socrates drink the hemlock and Jesus be nailed to the cross in divine devotion, and God not suffer? I cannot think that God is so compartmental as the old theology has made him, that as eternal Father he can sit apart in statuesque isolation from his incarnation in his Son, born of the travail of history, giving his life in love for humanity and the whole struggling world. It must mean

something poignantly painful to God that he is crucified in the flesh, suffers, dies and is buried. A God who does not feel pain could feel no compassion, the most precious attribute of God. Without sorrow heaven's harmony would be flat and insipid. God is both "the white radiance of eternity"[53] and the crimson suffering of light in this temporal world. And if his love suffers with ours to stain in beauty the mosaic of our life in the spirit, shall he not retain the mystic pattern? We must abandon our attempts to picture God, and accept the mystery of an eternal God living the tragic life of time, just as science accepts the mystery of light as being both a particle and a wave—though it cannot picture such duality—because experience requires both. Why should we suppose that we are better able to comprehend the ultimate mystery of God than science the mystery of light?

We must confess with humility that we cannot understand how God can be eternal and perfect, and yet be immanent in the temporal striving of history, incarnating himself in mortality. But if we must think of God in terms of our highest human experience, can we deny to him the things which make human experience significant? What would life be without risk and high adventure; without love and the suffering of realizing love in a mortal and uncertain world? Must not God, too, be disappointed in the failure of a sublime experiment, marred by the blindness and recalcitrance of his material; and yet persist with infinite patience, in spite of vicissitudes, to rectify, to transform the mistakes of his participants and in infinite pity try to save what can be saved,—make beautiful in tragedy, if not in comedy, the remnant of soul and use the waste material for a new experiment?

Some have given a mystical meaning to all evil and have tried to make believe that the ruthlessness of nature and the inhumanity of man are always part of a divine purpose. This seems to me a monstrous doctrine. I would rather think of God as one who suffers with us in

the tragedies of a blind world, and so can be our helper —not to justify evil—but to overcome evil; as one who shares the joys and sorrows of this transient world with us, who loves the lilies of the field, who is tender to the wounded sparrow, who tries to heal and comfort the sorrows of humanity. The church has been interested in the few elect. It has ignored the tragedy of the common lot. They are supposed to be damned for the glory of God. But what sort of God could find glory in damnation? Such a theology is the product of the sadism of perverted minds. Rather must we think of God—as Jesus did—as using all his efforts in redeeming those that are lost, as the shepherd hunts for his lost sheep, rejoicing more in the recovery of one lost sheep than in the ninety and nine who feel safe in the fold. The supreme, the infinite tragedy for God must be that a soul by its own blindness and perversity refuses to be saved. The saddest thing in all the world is the cry of a lost soul. Should Jesus weep over the indifference of the sons and daughters of Jerusalem, whom in his infinite pity he had repeatedly called as a mother-hen calls her brood under her wing; yet the God of Jesus not feel infinitely more the tragedy of all the lost, whom he has called in season and out of season? Should Jesus pray for mercy for those who in their blindness had crucified him, yet the God of Jesus not feel pity for all who cause suffering through their blindness? If the goal of creation is to bring to birth free spirit—the free devotion to beauty and goodness—is it not a tragedy that the great mass of humanity, having been led forth through ages of evolution, with such sacrifice and pain, to face the grand opportunity of winning the promised land of creative spirit, should yet prefer the flesh-pots of bondage? "Salvation must needs be difficult to find because so few find it," says Spinoza. In a world where everything is determined by God such failure is the tragedy of God. In a world, with its own pluralism and indifference, it is

the tragedy of the world, not of God. But shall not God feel infinitely the tragedy of the world which he created in love and tries to save?

In the life of every suffering noble spirit, sorrow is sublimated in the creative life. To create is painful, but the pain is transformed and made beautiful in the creative process. The creative life has the only compensation for pain. But the tragedy of pain and death of those who are not saved by noble endeavor is not sublimated in them. It has no compensation. It is sheer darkness. And a God whose function is to save, as well as to create, must feel the darkness of the lost. If it is the communion with the eternal, the love for the eternal, which makes the soul eternal and which spiritualizes the body too, then the commerce with the bestial and ephemeral must disintegrate the soul, as it brutalizes the body,

> till she quite lose
> The divine property of her first being.[54]

More terrible even than the torment of the damned is this deletion of spirituality, for while there is suffering there is the possibility of redemption in the mercy of God, but the deletion of spirit is the second death from which is no redemption. This must be the uttermost tragedy for redeeming love. But who shall venture to say that a soul is eternally dead, that the power of eternal love through the fire of suffering may not waken it from the tomb in which evil influences have buried it?

In the anguish of his love, God cries out to us to help to redeem the world, to make the world lovely and to save the beauty of the world—the beauty of nature, but especially the beauty of spirit: "Is it nothing to you, ye passers by, that I labour and suffer, that my life in the spirit is crucified? Hail to those that suffer with me in the cause of humanity, whose tender pity goes out to their brother, whoever he may be, white or black, European or Asiatic; who value the eternal glimpse of beauty, above temporal advantage; who forgive the past that

the future may be redeemed. Through suffering and sacrifice I create the beauty and loveliness of spirit; and I claim the birth of spirit as my own when worlds return to chaos. Worlds may perish. I shall create new worlds. What matters is the life in the spirit. This is eternal in the changes of time. It has its own community in all the ages. It makes its own heaven and its own hell. The world must needs bring pain and sorrow. The birth of spirit cannot come except through suffering. But be of good cheer, for I suffer with you and can help you to overcome the world. There must needs be suffering, but it is only suffering in consecrated love that can become remedial. In your own hearts must the grace of salvation be won and thence spread to light a sordid world. And though you go under, yet shall you not perish. The love of the eternal shall create from its own wreck the object which it contemplates."

* * *

The conclusion of my poem, so haltingly expressed, is that the life of nature is a tragic life without hope. Nature ever consumes itself in restlessness; and those that live the life of nature are ever carried hither and thither, in futile motion, by the winds of their desires. To find harmony of soul we must join that coice company who

> by due steps aspire
> To lay their just hands on that golden key
> That opes the Palace of Eternity.[88]

We must strive to discover the eternal meaning of life. It is only in the service of disinterested, imaginative love that we can become liberated from the routine of nature and win true freedom. The life of nature is bondage. To become truly free we must be born again into the life of the spirit; we must lay hold on the kingdom of heaven which is even now working in our deepest self. If there is to be harmonization of the warring motives of humanity, it must be on a spiritual plane. It cannot be attained

on the plane of material welfare, though we must strive to alleviate human misery and to equalize human opportunity. It can only come when we value soul more than body, spirit more than things. It must be a comradeship in the realization of spiritual values. We must realize our destiny in a spiritual community of creativeness, inspired by the eternal Spirit of creation. It is only as we become tuned to the eternal rhythm of God that we can attain serenity of life. This means renunciation of pettiness and selfishness. It means the devotion to a great ideal in harmony with those who strive to create a better world. It is only as creators, in the spirit of the Creator of the ages, that we can be saved. We cannot escape from the tragedy of life. We can only learn the meaning of life through pain. For creative spirit there is no lazy paradise, no idle millennium. The subjugation of chaos within us and outside us is a never ending struggle.

Life is ever the mingling of two strains—the jangling passions of nature and the celestial chorus of our ideals, making music in our souls. The strain of our ideals seems mostly faint and far-off. It is almost submerged at times in the discords of this world. But even so it is the eternal inspiration of life. And if we do not weary in well-doing but remain loyal to our faith in a kingdom we cannot see, with undying hope for a better future, and with a love that works unceasingly for its actuality, we shall in some mystic moment feel an intimation of the divine harmony —something sadder, sweeter far than any harmony realized by us—; and the divine tradegy of dying with God will also be for us the divine comedy of rising with God. The true mystery of the cross is that love is victorious through suffering. Here lies its real power. This is the eternal but forgotten truth of Christianity. Since God is both temporal and eternal, his life must, in some ineffable way, sublime into one unity the beauty of tragedy and the beauty of comedy—love's tears and children's laughter. The ultimate symphony of spirit must

somehow be triumphant over sorrow within its own pure and deathless harmony. But whatever be the divine harmony, the human striving for harmony, through suffering and atonement, the eternal longing for the unattainable, must ever be in the minor key.

Chapter 8

DIVINE LAUGHTER

A RELIGION OF JOY

Hence, brooding melancholy, begotten of a sick soul. The night is past. Hail Sun of gladness! Let us come into his presence with laughter and singing. Let us dance before our God as those of olden times. Let us cast away our winter garment of discontent. The year is always at the spring, for the spirit of the universe is joy and health and laughter. It dances in the sunbeams, it dances in the heart of the childlike. The joyous ones are the true worshipers of the God of gladness. God is pure, spontaneous creativeness, rejoicing in itself. He streams through the all as music to tune the world to harmony, to heal its sorrow. Sadness is the shadow of our limitation, of our failure to enter the divine dance of joy. The serious ones stand with their backs to the light. They see only their own shadow, and they say the world is dark. Let it be proclaimed to the ends of the world that the good life is the healthful life, the merry life. Life is health, joy, laughter. There is much disease and chaos and ugliness in the world. Yet is there a stream of love, of health and beauty-making power, flowing through the all. This is the sap and inspiration of creation. To live in this is health, happiness. Joy is strength. Sorrow is disease. Joy is growth in perfection. Misery is weakness and demoralization. Joy is the consciousness of an inflowing stream of love. Let us dig deep into our being that we may strike the day-spring of joy. For joy must be fed by joy—the eternal joy of the pervasive spirit and the joy of other souls. "Joy is born a twin." It cannot live in solitude. It must be shared and it is created in the sharing. Joy grows with sharing; sorrow diminishes with sharing. Sorrow is the negation of life, joy is life itself.

"Blessedness is not the reward of virtue, but blessedness is virtue itself; nor do we delight in blessedness because we restrain our lusts, but on the contrary because we delight in it, therefore we restrain them;"[56] because we are inspired and controlled by the creative spirit of the universe.

Work which is inspired by the pure joy of creation is its own reward. And joyful activity is that which creates joy,—

> Joy that ne'er was given
> Save to the pure, and in their purest hour,
> Life, and life's effluence, cloud at once and shower—
> Joy, lady, is the spirit and the power
> Which wedding nature to us gives in dower,
> A new Earth and Heaven,
> Undreamt of by the sensual and the proud;
> Joy is the sweet voice, Joy the luminous cloud—,"[57]

which transfigures life for those who are pure in heart. And those are pure in heart who love, who are capable of disinterested joy, those who have banished the demons of fear and envy, who have broken through the isolation of self, who have opened the windows of their soul to the light of the creative spirit that flows through the all. It flows through our individuality. Within bubbles up the fountain of eternal joy, when the heart sings with laughter, when love drowns pain in the joy of the birth of beauty.

> We in ourselves rejoice.
> And thence flows all that charms or ear or sight,
> All melodies the echoes of that voice,
> All colours a suffusion from that light.[58]

I am intoxicated with the sense of an unlimited goodness which transforms in beauty our mortality. In pious joy I worship this source of gladness, whether my altar be in the fields with the dome of the blue sky and the fragrance of the wild flowers, or in a gothic cathedral with its vaulted arches, its rose stained windows and its sacramental incense.

* * *

I said in my heart: "Oh, to stand at the beginning of creation, to be present at the grey dawn of the world, to smell the sweet fragrance of the first dew and to hear the first song of new-born joy, when the morning stars sing together." But in the vast all every moment is the beginning of creation. Just as on our moving earth it is always roseate dawn with "dewey pearls" somewhere and always evening with its shadowy cone somewhere, so in the cosmic whole it is always morning somewhere and evening somewhere in the creative cycle. "There never was more creation than there is now." There is always the joy of creation. There is always the chorus of the morning stars. It was not only in the olden time that

God made Heaven and Earth for joy he took in a rhyme,
Made them, and filled them full with the strong red wine of his mirth,
The splendid joy of the stars: the joy of the earth.[29]

God creates hitherto and forever in joy. In the immensity of the cosmos new worlds are born; and there is always a new world born with a new joy when a creative mind discovers and appreciates the master mind of creation.

The ancient poet who wrote, "In the beginning," placed himself on our earth as the absolute centre in the drama of creation. The intuition of the unknown Hebrew seer and of the divine Plato was sound, when they dramatized *our* world as having a beginning, middle and end. Our earth, with its firmament, and the life on the earth have a beginning in the mists of the hoary past. How long ago and what sort of beginning is veiled in obscurity. But whether the earth was born as an incandescent gas or as a gradual aggregation of star dust, at sometime there is the beginning of its story. In view of the later order this might well seem chaos, but in a real sense there is never complete chaos. It is only chaos when viewed without reference to time. The whole is an orderly process and the same forces work eternally to set the stage for the future drama. There is ever creative

genius present in the cosmos, permeating it and enveloping it with love; and there is always matter to be recreated and sublimed into higher stages of organization—so far as matter lends itself to creative transformation, whether nature or our own lives, for there must ever be willingness as well as genius. And creative genius is no less wonderful in the slow-moving pictures of geological time than in the dramatic staging of *Genesis*. Some have thought to eulogize God by making him the creator of both chaos and order. But the Hebrew prophets with their love of righteousness and the Greeks with their love of beauty thought of God as the creative genius which makes order out of chaos, even as we on a small scale strive to create order in the chaos of our own lives. There is ever the need of transforming the lower into the higher. And the lower, contrasted with the higher, is chaos. Further than that human experience does not guide us. Unless there is matter to be transformed by being spiritualized, religion, art and morality lose their significance and history becomes an arbitrary game. In this creative process, in the large as in our little human life, there are the joyous moments of activity and there is the gift of sleep—the preparation for a new moment in the creative process.

Nature is a great symphony with various movements synchronized into a harmonic whole. It reveals the architecture of divine genius, so far as this can be embodied in the restlessness and inertia of matter. But nature is not merely divine artistry, giving delight to the contemplative mind; it is also the stage for a spiritual drama, which is not of nature but is superimposed, in the advance of time, upon the framework of nature. More important than nature is the spiritual drama which emerges out of nature but which transcends nature. The creation of nature gives an opportunity for the creativeness of spirit which gives value to nature and which re-creates nature to serve the demands of spirit. Spirit is a tender

vine in the hardy climate of nature and subject to nature's vicissitudes, but it reaches up towards the light to the spiritual harmony which is God, and vastly outstrips the reach of nature which becomes a framework for its ascent, the scene of its venturesomeness, where it may objectify its wilfulness and, through creative atonement, discover the meaning and vocation in the spirit of the whole.

It is the poet who understands because it is the poet who loves. The poet in us feels the laughter in nature—the laughter of the dawn on the rosy mountain tops, the laughter of the setting sun when it turns the swift streams to gold. With St. Francis he loves Mother Earth and Father Sun and Sister Wind and all the varied colour and life of nature. For him

> Every hour of the light and dark is a miracle,
> Every cubic inch of space is a miracle;[60]

because his eye is innocent and he sees the miracle of creation everywhere—in the crystal and the sphere, in the plant and in the work of art. Because the joy of creation is in him, he feels the gurgling laughter of spring in the thawing ice and running brooks,

> When daffodils begin to peer
> For the red blood reigns in the winter's pale.[61]

And O! to be in the Southland after the winter rains, when the desert blooms as the rose and when the white blossoms of the almond trees shine like silver stars. He feels "the conquering laughter"[62] of the growing corn in the summer sun; and he feels the consummation of nature's laughter in the sweet fragrance of the red ripe fruit of harvest time. For nature's laughter moves to completion and rests for a new cycle. Only spirit reaches out for the infinite. The poet feels the laughter in nature everywhere for he is in rapport with the spirit of creation, which is joy, laughter. He shares in the life that expands in nature and in the soul of man. The laughter of fancy is also an expression of the spirit which creates

nature. Pan cannot die while the poet's imagination lives. He is the child of the same Spirit which creates the lilies of the field. He misses much who is too serious to delight in the fairyland of fancy, in sympathy with the lighter moods of nature. He misses all who misses the joy of life.

Laughter like music runs through all creation. Creation is a choral dance. The electrons dance according to rhythm and measure in the atom, the atoms dance in the molecule, the molecules dance in molar bodies. The stars dance in their own measures in space and time. And this dance is a willing dance by the initiative of the partners. There is tragedy and destruction for those who do not keep step. But oh, the joy to those who share in the dance! The partners change but the dance goes on eternally with ever new variations within the pattern of the whole. Through creative mind it is given to us not merely to be part of the dance, but also to share in the joy of creatively discovering new patterns to make the happy life. We rise superior to nature. We re-create nature.

As laughing sunbeams our spirits came from the Spirit of light and beauty to illumine this dark world and bring harmony to its strife. We are part of the world of change and mortality. In these mortal bodies, in this mortal society, we must realize our destiny. And our destiny is to let our light shine in a sordid world. To us the beam of light is given to realize in the struggles of mortality the immortal consummation of being free personalities. To him that overcometh shall be given the crown of glory of being a free creative spirit. Though we faint in our mortal weakness and though the light whence we came may at times be clouded to our vision, yet shall we win if we have faith. The creative life is triumphant, but it is triumphant through heroism. We carry the burden of the ages in our frame. In us is much of the worm, much of the ape, yet are we pregnant with the seed of the future, powerful to transform the past, and in the sunshine

of the whole to bring forth the higher man, if we respond in childlike innocence to the light that ever is. If we do not fail in the heat of the day, but work in creative love, "from strength to strength advancing," we shall mount to eternal life. Joy is the note of the divine laughter in our souls, the note of victory. Do we go under? We must go under that the higher may be born. But we cannot utterly perish if we work for nobler things. We shall live in the spirit of creativeness which inspires us. Why be afraid of death? The creative life knows no death. Laughing we shall return to the Light that sent us, having earned our birthright to be free creators even as God is creative. Then shall we laugh at sorrow, laugh at death. A voice within us says there is no death. The creative life is immortal joy, eternal laughter.[63]

Oh, the joy of this moment of revelation. I feel a spirit of creativeness surging through the frame of the universe, through my frame. It inspires and exalts me. It blows through my being like a fresh breeze, it fills my mortal sails under the blue sky. It is a breath of life, of eternity, in a changing world. What matters it that the world must pass through its cycles of change? The eternal lives in me. It dispels fear and sorrow and fills me with the divine urge to create. For I feel assured that the mission of spirit is to make things new and fresh and beautiful, to bring form into a chaotic world. And though I fail now, the spirit of creativeness will save my feeble efforts for greater achievement. What if my work perishes? The spirit of creativeness will build out of it nobler work. It is the glory of man that he is to be surpassed. I have confidence that nothing of truth and goodness and beauty shall ever perish in the whole. Though my creation is but of the moment, if it is worthy, it shall be confirmed by eternity when the master artist takes up into his woof of eternity the significant threads of our little lives. Spirit is the light of creation, and though I die the light which I kindle will keep on shining through

the ages, even as the light of a vanished star. And shall the spirit of creativeness in me not seek and find the master Spirit to whom it owes its birth?

* * *

Laughter is an expression of life and a revelation of life. There are many kinds of laughter. Not all human laughter is divine laughter. There is the fiendish laughter of envy and malice which finds a swelling of self in the misfortunes of others. Such laughter should be banished to the pit of hell whence it comes. There is the hollow laughter of the empty minded which only reveals his emptiness. There is the disinterested laughter at the incongruities and follies of life—our own lives and the lives of others. Such laughter relieves the strain of life. It makes us see ourselves and others in saner perspective. Comedy may be purgative as well as tragedy. There is the laughter which scorns and sears the arrogance and vanity of the oppressors and mountebanks of the human race. Such laughter is more destructive than wrath. There is the laughter which is born out of the pure joy of living, the spontaneous expression of health and energy—the sweet laughter of the child. This is a gift of God. There is the warm laughter of the kindly soul which heartens the discouraged, gives health to the sick and comfort to the dying. There is the free spirit's laughter at the grubbers who fail to look up at the sky, "the grave diggers" who are so absorbed in the past that they miss the life that is. There is, above all, the laughter that comes from the eternal joy of creation, the joy of making the world new, the joy of expressing the inner riches of the soul—laughter that triumphs over pain and hardship in the passion for an enduring ideal, the joy of bringing the light of happiness, of truth and beauty into a dark world. This is divine laughter par excellence. It may be the strenuous laughter of the heroes of mankind, the laughter of those who march forward in a great

cause, singing the song of salvation through hardship, suffering and death—no longer the dirge at the rivers of Babylon, no longer the mournful strains of the Volga song, but the hymn of triumph, the Marsellaise of freedom. It may be the mystic laughter when the spirit is relaxed and feels the love of the universe enveloping it.

The first commandment is: Be creative as God is creative. And creation is joy—joy to the creator and to those who share in the creation. Creation is not just the privilege of a few geniuses. It is possible for every intelligent being to be creative in some measure. The joy of creation is the main thing. It is not the scale of success that matters.

> In small proportions we just beauties see,
> And in short measures life may perfect be.[44]

We can all share in the creative spirit of increasing the joy in the world—joy in loving converse and sympathy, not merely sympathy in sorrow though that transforms sorrow, but *Mitfreude,** joy in others' joy; and though it be in the humblest human relations, it shall count eternally. What if the forces of nature be indifferent? What if a blind society be hostile? I have the spirit to create a new world out of nature, out of society—incarnating my insight and friendliness, so far as I am able.

Life belongs to those who love, who hope, who have faith in the future, in a nobler humanity, in the spirit of truth; who have the courage born of love. What if we cannot be perfect? If we have the spirit of creativeness we shall help towards a perfection, a joy, of which we cannot dream. If you seem too insignificant to make the world over, remember that there is strength in unity. Take courage and help push; and the rotten walls of man's prison shall give way and the light of freedom shall come in. Let us not lose heart in experimenting to make life happy, to create new joys—joys which are pure

* We have no word in English for sympathy in joy as the German has.

and productive, which make more of joy possible, the laughter of the spirit which makes matter the instrument of the soul. We shall fail many times, but we shall be happy in trying; and the joy of the spirit of creativeness shall endure like sweet music—the laughter that can meet death because it comes from the fountain of eternity. To have seen beauty, truth, even for a moment makes life immortal.

The accidents, which come to me from the play of nature's forces, I do not chide. They are innocent as children. They dance their own dance according to their own rhythm. How could they know of the spiritual temples which we build upon their shifting sand? There is no malice in their ignorance. The wind of nature blows as it listeth. But in nature is a spirit working, which nature cannot know. Silently it guides the forces of nature, so far as they are willing, towards a nobler future. Spirit may seem a small voice in the thunder of nature, but it is prophetic of a realm of values which nature cannot know. There must be a Spirit of goodness and beauty working through the cycles of nature, for we discover much beauty and goodness in our own experience. If we come into rapport with this Spirit of goodness, we can in a measure create goodness and beauty, using the forces of nature as our instruments for a season. And we shall experience the joy of the birth of a new soul in nature. In this we are infinitely superior to nature. We give meaning to nature, value to nature. For this creative life of spirit, nature is the temporary scaffolding. It must perish, but the life of spirit is eternal. We shall make out of the blindness of nature, out of the blindness of man, the opportunity of creating the greater man. Though we suffer in the new birth, we shall laugh in the spirit—the laughter of the mother when in the fear and agony of travail she rejoices that a child is born into the world.

* * *

Unhappiness must be treated as a dangerous disease and its causes must be probed by the skillful physician to find the canker of grief. It was a sound intuition which led the ancient poet to pray: "Search me, O God, and know my heart; try me and know my thoughts. And see if there be any way of sorrow in me and lead me into the way everlasting." If the seat of the disease is in the body, then the body must be subjected to the proper regimen to restore its normal function. Much of our sadness and discontent is due to a bad digestion. If the root is in the mind, then the mind must be purged. If the trouble is some obstruction of emotion, this must be exposed and sublimated. If the cause is false ideas about life and human aims, then there must be the proper education. Here lies the most accessible root because here a cure can be found, if we can discover the right philosophy. Even in a world which is out of joint, we may still preserve our own equanimity and find the very zest of activity in the making over of the world; and the world is always more or less out of joint. If the trouble is in the hindrances of society and its oppression, then we must strive with all our might to right society. Society should do this for its own sake, even if it does not love the individual. For society cannot remain stable, if the individuals are restless and discontented. We must ever keep in mind that the happy life is the normal life. Discontent is a dangerous epidemic.

If the root of the trouble is in our religion, then we must discover the religion which gives freedom and happiness. Religions have a heavy responsibility for making men miserable by peopling the universe with hobgoblins and scarecrows to make men fearful when they should make men happy. Why do religions bewail the emptiness of their churches, the lukewarmness and even hostility of the people whom they claim to serve? Instead of bewailing that men turn away from them, should they not rather bewail that they have turned away from the only

true God whose service is joy and freedom? Why do men throw away their gods and their ceremonies when they strive for freedom and happiness? It must be that they are false gods. The true God is a God of love, of joy and laughter, who wants his children to be free and happy. Human beings will love the God who, they feel, loves them and helps them. In their sincerity and loyalty to the common joy, they will hear the voice of God.

Banish all creeds and institutions which would hold men in slavery and which make religion a mask for selfishness and oppression. Let the message of religion be human happiness, and men will love religion. What does God want but that human beings shall live together in love and joy? It is thus that they serve the God of love, and increase the love, and so increase the joy in the world. Only such a religion will prosper. Though the churches may deceive men for a while with pretence, though they may hold men in bondage with superstition for a while, men will surely turn on them in time. And in their ignorance they will vent their wrath on him who brought love and healing and joy to man. He was so transformed by superstition that they knew him not and thought he was their enemy. But though they may worship him under some other name, dear to them, in his spirit of love lies their hope, and in time they shall recognize the Carpenter of Nazareth who gave his life joyfully that men might be free. Men are hungry for a religion which will give them hope and courage in their upward struggle. They do not crave vaudeville. If institutions do not see this, the divine sunshine will consume them, and men will laugh at their illusions.

Let there be joy and laughter and singing for man is marching on. Chant the song of the triumph of man, which is the triumph of God. The angel chorus never sang over Bethlehem its song of peace and good will more truly than it is singing in the hearts of men now. And the song is swelling above the noisy clamor of this selfish

world. If the gain seems small, look behind at the road which man has traveled from the beast. There will be many mistakes and much suffering, but these are the pangs of birth of a new era. For the kingdom of heaven, which is the kingdom of man, is at hand. Those that will to be free and win the grace to be free shall be victorious, however long the route. They are strong in their joy and there is laughter in heaven: their laughter is heaven, the battle is the victory.

It has been said that religion is the conservation of values, as if God had nothing to do but to sit on the lid. I say religion is the creation of values. We conserve values by re-creating them into nobler values. It is as creators that we are fired by the spirit of God. We worship the creative spirit of the universe, when we abandon ourselves to the creation of values. This is the joy of life, though the fire consume us. It is a glorious life to be consumed, like the Phoenix, that something nobler may be born, to burn to ashes to light the path of humanity. The past vision of man is conserved truly only when it is re-created in our own experience. Unless the seed of the past dies and is resurrected in a new life, it lies unfruitful. Those who would conserve the past, by keeping it past, conserve only a corpse. The spirit of creativeness lets the dead bury their dead and moves on to new creation.

* * *

The ancient Hebrews gave the world a matchless spiritual heritage which has become interlaced with all that is noblest in Western civilization. Nevertheless, it is a tragedy that the western world received its religion from a people whose philosophy of life evolved in the bitterness of defeat, whose intense nationalism interpreted their misfortunes as punishment for national guilt, and who could find no joy in life except in the future when their national guilt should be expiated. In the

meantime it was a sin to be merry. "Woe to those who laugh now, for they shall weep." "Blessed be those who weep now for they shall laugh." It was not always so. Once the Hebrews were a happy people who worshipped their God with singing, dancing and laughter. But this was forgotten in the centuries of suffering which they believed that their God visited upon them for their sins. And their chief thought became the expiation of guilt through an elaborate priestly ritual.

There came indeed out of Israel a saviour who taught that God is love, that his grace falls freely like rain and sunshine upon the just and the unjust, to quicken and give life if they will receive it. Jesus turned his back upon the religion of sack-cloth and ashes and proclaimed the good tidings of joy. He turned his back upon the desert with its self-negation and introversion to find the joy of life in working for humanity—God's lost children. He showed that it is not necessary to wait for a national salvation in the far off future in order to be happy, for we can even now create a kingdom of heaven in a sordid world if we tap the resources of love within us. Love is the secret of the happy life, and where love is there is no need of expiation, for love is above forgiveness. It requires only the willing heart. The repentant prodigal goes through no ceremony of expiation. He is given a banquet. Forgive your brother seven times? Nay, seventy times seven. Love does not count offences. Love is above pity in the vulgar sense. The priest and the levite pity the unfortunate man—and walk on the other side. The good Samaritan forgets all about pity and in love heals his wounds. The test of forgiveness is in the expression of love. To her that loves much, much is forgiven.

There is only one sin—selfishness; only one virtue—love, which is the fulfillment of the law. There is only one test of fitness for the kingdom of heaven, and that is the love of one's neighbor; by that we stand approved

or condemned. This love shows itself not in the quantity but in the sincerity and wholeheartedness of one's gift. It seeks no reward but the act of love. Did a mother ever expect a reward for the labor and love she gives her child? In the furtherance of the kingdom of man we must love the humanity even of our enemies, for how else can the breach in humanity be healed? And we may be obliged to hate the selfishness and blindness of our friends, even a father or a mother, when they stand in the way of the higher love which we owe to future man, a greater humanity. Love is a gentle mother to the poor, the sick, the oppressed, to those who would learn the way of life, but oh, the wrath of love against those who would destroy love—the selfish ones who would use men's holiest instincts to victimize them, the hypocrites who under pretext of making long prayers rob the widow of her substance.

Love must become incarnate in humanity. We worship God by loving man. All institutions and laws must be instrumental to the kingdom of man, to human fulfillment and joy. Where there is true love, life is a marriage feast. We should rejoice and be glad even when we suffer for the cause of man, for so we help to initiate the kingdom of the future. There are no classes of man except those who love and those who do not love. All are pure and good who love, and all are impure and evil who fail to love. There must be only one rivalry and that is the rivalry in the expression of love. The rivalries of this world are illusions which divide human beings. Because Jesus loved human beings and gave them the red wine of happiness, his enemies, the serious ones, with their hang-dog religion, called him a glutton and a wine-bibber, the friend of publicans and sinners. They felt righteous by putting the evil eye on their neighbor and thought they were virtuous because they tried to escape the punishment of their divine despot. The serious one cannot endure the music and laughter of the father's house. He

remains grumbling outside. But he has the reward of his petty virtues. The great human joy is not for him who lacks love. It was fitting that the Greek Christians should keep the day which was sacred to their master as a feast day, a day of joy, even though they sometimes went to excess in their cult of the purified and sublimated Dionysus. It was a contagious joy which made it possible for the persecuted Christians to meet all the sufferings with a triumphant song. They met death with unconquerable laughter and won their persecutors.

Then came the tragedy of Christianity. A Pharisee of Pharisees, with indomitable energy, succeeded in reinterpreting this religion of joy into a religion of sin and expiation. St. Paul fell back upon the primitive tribal idea of guilt, though this had been repudiated by the Hebrew prophets as far back as Jeremiah who declared that only the soul that sinneth shall die, and though Athenian law, four centuries before, had decreed that all guilt is personal. For St. Paul the whole race is caught in the guilt of the first sinner. Life is poisoned at the fount and becomes a sin which must be expiated by the innocent—the death of Jesus being a sacrifice through which others' sins can be atoned. St. Paul and his successors succeeded in nullifying the whole essence of the religion of Jesus. God becomes a despot who demands expiation, instead of the loving father of man.

There is only one original sin: "Ever since man came into existence he hath had too little joy."[65] The reason that man has had so little joy is that man from the beginning has been at war with himself. His individual life has been a perpetual conflict of his blind desires, each seeking its own fulfillment. And his external life has been a blind struggle of man with man and of man with nature. Life can only find joy in unity. It must discover the wholeness of life in which the individual desires can be realized in their due measure and proportion. Life must play the whole gamut of human nature in harmonious

composition. It must become music. It must discover unities in which individuals can realize themselves together. We can only realize ourselves by becoming partners in a community of creation. For man cannot live unto himself. He must discover not only the community of man with man but also the community of man with the universal Spirit of wholeness, for life can only be completed within the whole. There is too little joy in the world because there is too little love. Break the alabaster box of your heart and let the fragrance flow out.

Happiness is not a mere spontaneous outburst of joy, now and then, but continuous laughter, which issues from the depths of the soul. The soul craves not merely the good but the eternal possession of the good. What the soul really loves is eternity, whether it be in the procreation of mortal children, that life may go on, or in the procreating of spiritual unities. The true satisfaction of the soul can come only when it is married to eternity. The temporal striving can have meaning only when it incarnates the eternal form of its being. It is the spiritual patterns which endure when the temporal bearers perish. In the world of spirit nothing good or beautiful shall perish, though material worlds return to chaos. Nothing is immortal except what is adopted by the eternal Spirit. To become immortal we must become worthy of immortality. And we can become worthy of immortality only by loving the eternal. To love the eternal is to be eternal, so far as mortal man can, for there is much in us that is earthly.

* * *

Man's genius has applied itself with marvelous industry to discover the formulae of nature. Thousands of workers are busy discovering formulae of new chemical compounds in which the atoms may cooperate in the service of man; and they rightly rejoice in their success. Is it not of vastly greater importance to discover formu-

lae whereby the human atoms may cooperate in patterns of family, community, nations and associations of nations to the greater joy and happiness of all? If human beings continue to live in distrust and hatred, with tragic outbursts of animal fury, our formulae for controlling nature shall only multiply our human tragedy. It is high time to turn our energies to discover the true formulae for human cooperation and happiness. All other discovery and contrivance must be instrumental to the chief end of life. In such discovery, even more than in the discovery of natural laws, shall we find the secret of nature —the divine joy in creation. And who can believe that a true formula for the synthetic fusing of human beings into harmonious relations is less founded in the genius of the universe than that of new syntheses of chemical atoms?

Let man do his work with laughter and singing! And man will do his work with laughter when the work expresses himself, when it is born out of the love of his heart. If the work cannot be done with laughter, let the hours be short and let the conditions be bright and healthful. More and more the machine, which man has created, shall take the burden off man's back and give him greater freedom and leisure. Man must see to it that the machine works for man and not just for the selfish ones who would enslave man. What blindness, what crime that the machine should multiply the creative power of man and the wealth of man, and yet vast masses of men be in want because of the abundance of wealth! Man must learn that it is not enough to re-create *nature* and make nature work for him, but that he must also re-create *human nature* and make his institutions work for him.

To reap the fruits of the machine and the leisure which the machine gives, man's nature must be cultivated. Man must cultivate his inner resources as well as his outer resources, and the former are the more important for the true joy of life. If greater material resources are made

to minister to sordid pleasures, they may become a curse instead of a blessing. What doth it profit a man to acquire wealth, if he seeks merely the satisfactions of a pig? If the poor at present are cursed with want, the rich are often cursed with an empty swinishness. The real joy of life must come with the cultivation of spirit. It comes only to those who love mankind in purity and devotion; who strive to make the world better by making it kindlier and wiser and more beautiful. We must learn that soul is infinitely more precious than things and that no worldly gain can offset the loss of the soul. He who possesses riches of soul can be happy even in material privation and in spite of the blindness of those who would enslave him. An Epictetus could sing his song of praise even in slavery and physical suffering, while the vulgar rich and spiritually enslaved were miserable with ennui, because in their pursuit of animal pleasures they left the soul frustrated.

All good things must be cultivated. They do not grow like weeds. The garden of the soul will bring forth the choicest fruits only by conscientious care. The joy that comes from the discovery of truth, from the creation of beauty, from the enjoyment of friendship, the choicest of all fruits, comes only by discipline. Our time is a rank garden where the weeds of passion grow apace and suffocate the nobler shoots of human nature. And yet we wonder why we are unhappy. We must apply ourselves to the cultivation of human nature as assiduously as we have applied ourselves to the cultivation of physical nature, or our increased resources will only multiply our discontent. For man doth not live by bread alone. Primarily he lives by the resources of spirit. It is spirit which gives value to material nature. When we have a cultivated spirit, we find occasions for joy everywhere. All seasons are beautiful and inspire joy in the healthy soul—winter with its bright stillness and its clear pastel patterns, spring with its birth of life and song, summer with its

bigness and luxuriance of growth, and autumn with its golden harvest. The day reveals untold wonders and the night enfolds us in mystery. But above all there is the perpetual love and wonder of human relations.

You cry, alas! the many do not care for the higher joys. They live like beasts. And who has degraded them into beasts? Bring the joy of freedom of expression to more of mankind and make the opportunities for the higher joys as common as the sunshine, and more will enjoy music and art and science; and what is best of all—more will enjoy each other in purity of soul. Give men the sense of free activity, of free expression, and they will laugh. Take away the uncertainties that frustrate love and give them security at least in the simple material needs; abolish dire want and slavish dependence that men may apply themselves to the values of the spirit. The joyous life does not require great material possessions; a little of this world is sufficient when there are resources of soul, and much hampers the soul and may make it a slave.

* * *

Cease to make virtues out of negations and make virtues out of helpfulness and mirth. Gravity is as dangerous as frivolity. Let the noble, the beautiful, be the inspiration and touchstone of virtue, for the noble is that which ennobles, the beautiful is that which makes beautiful. Cease to make the restraints of the animal the sum of virtue. Make the activity and joy of the spirit the center of education, and the animal will become spiritualized. Give glory to those who work and suffer in the cause of human happiness, instead of those who murder joy. Cease to count mistakes and count attainments. Cease to look for the mote in your brother's eye and make him feel that you love him and the motes will become harmless. It is your own depravity of soul which makes you find compensation in degrading your brother.

Give him joy in his work, and he will no longer annoy you with his faults, but will bring you joy. Rejoice in his joy and thus multiply his joy and yours. It is difficult to rejoice in the fullness of another's joy, when our own life is empty. It is our pettiness that makes us envious and miserable. We are envious of another's joy because we fail of joy in ourselves and therefore try to destroy his joy. Because men are mean and envious they like to pity others' misfortunes. It gives them a sense of superiority.

Let the aims be broad and spiritual, and there will be no conflict of aims, no envy of others' success. When the aim is to enrich life in love, in beauty and truth, we can all share in the joy of success, and so make it our common achievement. Let us all give ourselves for the more abundant life, and we shall be rich in the abundance. We have been held back too long by prohibitions and taboos, as though God hated the free and happy, forgetting that God is joy and is manifested in the joyous life. When men feel this, they shall worship God in joy. There is only one ultimate tragedy and that is the tragedy of spirit. When spirit is saved, all is saved, whether it goes on or not; and it will surely go on somehow. Live as though material things were toys and instruments of spirit. Though misfortune must come in the world of mortality, love will take away its sting. Even though life is hard and sorrow must come in the course of nature and death overtake us, yet shall the source of joy, if we are heroic, not dry up but transfigure life and death. Let us venture

> All, all for immortality,
> Love, like the light, silently wrapping all.*

And Eternity is not mere duration in time, but that which is noble and significant.

Cease to live in the past and live for the future. Repentance, regret, remorse are hindrances to life and become a disease unless they are sublimated into greater

kindliness and greater service for the future. All moralities and all religions which make man a bond-slave to the past must be banished. There must be only life and more abundant life—the life of freemen who own the past, who own institutions, who own the earth, to make them their own. It is true that we must not live in the wilderness with the wild beasts. We must safeguard the conquests which man has made over his animal nature in his institutions. But we are only true to the conquests of the past when we in turn make use of the vantage ground which the pioneers of the past have won for us to make further conquests of the no-man's land of the present.

Give humanity hope and it will dare and suffer joyfully, not counting the cost—hope with laughter on her banner and on her face the fresh beauty of the morn. And let that hope be the highest hope—the creation of a nobler and happier humanity—; and the hope shall endure and suffice through ages of struggle and suffering. And it shall surely come out victorious. Men will forget their hardships and even glory in them when they work with hope. They will suffer privations with laughter; they will go through fire singing, when hope inspires them. But the hope must be rooted in faith in the good, and it must be fed by a deep, continuous stream of love. "Love alone makes light all that is burdensome and bears with even mind all that is uneven. For it carries a burthen without being burthened; and it makes all that which is bitter sweet and savory."[67] Only a hope which is rooted in faith and love can heal the schisms within the human soul and heal the schisms into which humanity is divided in its blind struggle.

Let the love of humanity be a flaming sword against institutions and schemes that would degrade man into a mere thing. Let there be war against the blindness and illusions which have made the inequalities which rob man of his heritage in Mother Earth. Though the struggle be long, yet will it keep alive the fire of hope; and

it shall surely triumph in the ages, if man keeps his hope alive. Most precious of all, it will free the soul of man from slavery. Only the free can be happy. Man must be liberated from the blindness which makes man a tool against his brother man. Let brother forever refuse to carry arms against brother in the service of the selfish that have used humanity for their game. Let man rather suffer anything than to be made a blind tool against man. But let there be no vindictiveness in the wrath against the blindness of man. Let there be love for man, that the schisms may be healed.

* * *

With gladsome faces turn we towards the morn, the dawn of the greater humanity, the promise, the hope of the future. In the spirit of creativeness I feel in community with the Spirit of the universe. And in this Spirit I can hear for a moment with Dante in Paradise the universal chant of creation. Dante translated his rapture into the stately language of mediaeval liturgy.

> Glory be to the Father, to the Son
> And Holy Ghost! All Paradise began,
> So that the melody inebriate made me.
> What I beheld seemed unto me a smile
> Of the Universe; for my inebriation
> Found entrance through the hearing and the sight.
> O joy! O gladness inexpressible!
> O perfect life of love and peacefulness!
> O riches without hankering secure![68]

But the chant I hear is the chant of humanity, marching onwards. Each age must give its own appropriate expression to the joy it feels. The joy of community with the divine spirit, whenever it transforms nature and man with its laughter, is Paradise.

Hail to the creators, hail to the thyrsus bearers, for they are sons of God. They light their torch of truth from the ever-living flame which burns in the creative souls who precede them in the procession of the ages; they go forward to light the darkness a little further ahead, un-

til they in turn light the torches of another generation, thus making a running fire through the ages to consume the chaff of illusion and to spread the light.

The great pervasive stream of spirit purifies all, as the stream of sunlight purifies the filth of the earth. There can be no evil in God. Evil is self-defeating, self-destructive. It is disease, disorganization, maladjustment, death. The good is health, harmony, strength, life. Evil cannot exist except as a parasite upon the good; and the good will rectify itself and throw off the evil, as health throws off disease. God is goodness, beauty, joy, laughter. Only the good is immortal.

Roaming in thought over the Universe, I saw the little that is Good steadily hastening towards immortality,
And the vast that is evil I saw hastening to merge itself and become lost and dead.[69]

All nature under the guidance of Spirit, strives for completion; and though many times checked by interference in our pluralistic, uncertain world, it shall somehow complete itself. It is the good which has strength and immortality. And the good is joy, laughter, happiness. It is a false ideal that the bad life is the pleasant life and that the good life is irksome and therefore must be rewarded for its pains. The good life is its own reward. It is happiness. It is music which completes itself in its own symphony. And it completes itself through mastering and overcoming discord. Only when I feel the music hastening to completion in my own soul do I understand—

Surveying a while the heights I rolled from into the deep:
Which hark, I have dared and done, for my resting place is found
The C Major of this life.[70]

What is this Joy that fills my heart with gladness, this God of my delight? How can I, a wave tossed up for a moment by the tide of time, presume to comprehend the Mystery of the whole? But when in some rare moments my life is lifted beyond the sea of change: when my soul is set afire by the harmony of colours dashed by the setting sun on the naked ranges of the desert; when a flash

of insight illuminates a puzzling world; when my soul is swept away on a tender symphony of sound; when I feel enveloped and stirred by a universal love of humanity; when in the quiet of some Gothic cathedral or in the silence of the forest or alone on a mountain peak my whole being goes out into communion with the unseen Harmony, my heart says: This is God. My imagination pictures Him as the best in a changing, imperfect world, but my soul is thrilled with Eternity.

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