THE REAL AND THE IDEAL

1. SCIENCE VERSUS TRADITION

Since the earliest records of human history, the antinomy of the real and the ideal, of the material and the spiritual, have appeared in the thoughts, literatures, and religions of all peoples. This antithesis has been especially emphasized during the past three or four hundred years by the revelations of modern science.

(1) *The Copernican Theory Versus a Flat and Stationary Earth.* The year 1940 marked the four hundredth anniversary of the publication of a preliminary account of the Copernican theory, the definitive publication of which did not occur until 1543 when Copernicus was on his death bed. This theory and its confirmation by Galileo was in many respects the most revolutionary discovery in the whole history of science, but like many other great discoveries it was in many respects anticipated in ancient Greece and then forgotten. As long as it was possible to regard the earth as the center of the universe, and the sun, moon, and stars as designed to give light on the earth, it could be said that in all creation there was no place so important as the earth, on the earth nothing superior to man, and in man nothing supreme but mind and soul.

The Copernican theory was the first step of modern science in the demoting of man from this supreme position, and it seemed to contradict the evidences of common sense as
well as the plain statements of the Scriptures. Consequently it was denounced by the Roman Catholic Church as heretical and directly opposed to the authority of the Scriptures; Martin Luther called it a "fool idea," and John Wesley admitted that "it tended to infidelity." Even Francis Bacon, the herald of modern science, could never believe that the earth revolved around the sun. The old conception of a flat earth in the center of the universe dies hard, and there are still some benighted religious sects that make this a cardinal doctrine of their faith. But among enlightened people everywhere there is no longer any question of the truth of the Copernican theory.

(2) The Law of Gravity Versus Supernaturalism. One hundred and forty-five years after the death of Copernicus the Royal Society of London finished the publication of Newton's *Principia Mathematica* in which the law of gravity was demonstrated, perhaps the most fundamental law in all nature. I once heard that eminent mathematician and astronomer, Ernest W. Brown, say that his calculations of the mutual attractions and motions of the earth and the moon showed that the law of gravity, namely, that bodies attract one another directly as their masses and inversely as the square of the distance between them, was true within a possible error of one part in ten millions, and he expressed his amazement that it was possible by a few words and symbols to express any conception with so great accuracy. William Jennings Bryan used to say that he could demonstrate the law of gravity by throwing his hat into the air, but it took Newton twenty years to demonstrate this law.

When the wide applications of this principle to the movements of all the heavenly bodies as well as to all objects on earth were first fully appreciated, some persons denounced the law of gravity as an attempt to banish God from his
universe and to put a mere mechanical law in his place. Even today some critics of science and advocates of supernaturalism take great joy in the minor corrections of Newton’s law proposed by Einstein, but no rational person now denies that there is a universal law of gravity and that, as Samuel Rogers wrote,

The very law which moulds a tear
And bids it trickle from its source,—
That law preserves the earth a sphere,
And guides the planets in their course.

(3) Natural Evolution Versus Supernatural Creation. In 1859, one hundred and seventy two years after Newton’s announcement of the law of gravity, Charles Darwin published his book on The Origin of Species, giving convincing evidences of the evolution of species and larger groups and proposing a theory of the principal causes of evolution. In 1871, his book on The Descent of Man furnished evidences of the evolution not only of the human body but also of the mind and morals of man. Probably no scientific generalization has ever met with more violent opposition than this, but year by year it has received increasing confirmation, so that now it is almost universally accepted by scientists, and is opposed only by those who reject the methods and results of science.

These three dates, 1543, 1688, 1859, mark three of the major revolutions in human thought regarding man’s place in nature. Thus step by step science has demoted man from his former proud eminence as “lord of creation,” and has replaced the concept of supernatural fiat by that of natural law. The earth is a minor planet in a second-rate stellar system in one of millions of island universes. Man is one of a million known species of animals that have appeared, flourished, and disappeared during a thousand million years
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past. The human species, like all other species, has come into being by natural evolution and not by supernatural creation. In both phylogeny and ontogeny, body, mind, and morals have developed by natural processes. Even ideas and ideals of God, religion, ethics, and immortality have undergone natural development in the course of human history and in the individual human consciousness. One after another, man's beliefs in his uniquely divine origin and immortal destiny, and his conception of an original paradise in which men were like gods and gods like men, have been cruelly shaken. Those who refuse to accept such conclusions and denounce the "naturalistic conception of man" show a lack of appreciation of the many sciences that deal with man. He can no more be placed outside of nature or superior to it than the earth can be located at the center of the universe.

(4) Scientific Evidence Versus Emotional Beliefs. Science is knowledge—organized, classified, verified knowledge of phenomena. It deals largely with objective reality, and in the search for truth it attempts to restrict subjective feelings, desires, and imaginations to the rôle of stimuli, but never to allow such feelings or desires to determine what is true and what is false. Many centuries of human experience have shown that knowledge based on accurate and tried observations and experiments is a safer guide to truth than unverified fancy, that reason is a safer judge than emotion, experiment a surer test than intuition. All advances that have been made in the sciences of astronomy, geology, physics, chemistry, biology, and psychology have been made by adherence to the methods of science, and not by means of wishful thinking.

And yet the scientist does not and cannot rule out all feelings and emotions in his quest for truth, because, for one thing, emotion and imagination as well as intelligence and
reason are elements of his nature that cannot be sharply separated or isolated, and, for another thing, they furnish the stimuli for this quest. But he can and must try all things by the tests of objective reality. Never does he test reality by ideality, reason by emotion, or fact by fancy, but always he reverses this process and tests fancy by fact, emotion by reason, intuition by experience.

Critics of science and the scientific method never fail to point out the fact that scientific theories and conclusions are constantly changing. If you would keep up with science, they say, you must consult the latest journals and books; whereas the superiority of art, literature, and poetry is shown by the fact that they are ageless, the oldest works often being the best. This argument asserts that beauty is not only more constant and perfect than knowledge, but also that emotion and intuition are safer guides to truth than the methods of science.

No one wishes to deny the fact that "knowledge grows from more to more." We are proud of the "advancement of science." We realize that knowledge is never perfect and that the progress of science consists in continual approximations to the truth without ever reaching absolute truth. Why it should be thought that primitive or static forms of art, literature, or poetry are necessarily superior to later and more progressive forms, is difficult to understand. Even artists and poets admit that the art and literature of ancient Greece were variations and, in some respects, improvements upon the art forms of earlier times, and if no possible improvements are conceivable over ancient Greek art, at least there have been many variations in the art forms of different times and places. In short, art and its appreciation vary as much as science.

But the correlative claim that emotion and intuition are
safer guides to truth than science is contradicted by many historic instances. Intuition taught that the forces and phenomena of nature were the acts of gods or demons or preternatural beings. All nature was regarded as the immediate expression of the wills of such beings. The lightning was hurled from the hand of Jove, the sea was disturbed or calmed as Neptune determined, Aeolus let loose or confined the winds, the earth trembled and volcanoes smoked when Enceladus turned over, Apollo drove the chariot of the sun across the sky, the earth was flat and the center of the universe, the planets travelled their appointed courses as they were guided by their angels, gods of birth and death and fate presided over human destinies, diseases of body and mind were caused by demons that took possession of human beings and could be driven out only by fire and water and magic. All nature was the expression of wills, big or little, good or bad, and the good must be praised, the bad circumvented by sacrifices or magic.

Most of these primitive intuitions concerning natural phenomena are now regarded merely as poetic symbolism, but they were not so regarded in former times. If the gods and demons have departed, it is because science has revealed the natural causes of these phenomena. Some of these primitive intuitions have only recently been cast aside by enlightened persons, but are still believed in by the ignorant. Among these is the belief in witches, who were supposed to be in league with the devil. By intuition all forms of superstition, magic, and folklore have been accepted as explanations of natural phenomena, and are still accepted by some persons. Astrology, palmistry, crystal gazing are held to reveal future events, and many thousands of deluded people pour out many millions of dollars every year in consulting the practitioners of these false sciences and black arts.
Weather prophecies founded upon the abundance of fat or fur or feathers of animals, the flight of birds, or the awakening of ground hogs, are accepted by multitudes as superior to those of the Weather Bureau, because they are founded on intuition rather than reason. By intuition some nations and races and persons know themselves to be superior to all others. They think with their blood and feel victory in their bones, and are certain that such intuitions are superior to cold science and reason.

What are these magical intuitions? Are they supernatural revelations of truth, superior to ordinary methods of common sense? They are notoriously liable to error, as has been demonstrated again and again in actual experience. In so far as intuitions are reliable and not mere fancies, and many such there are, they appear to be the results of keen observation and rapid, though often unrecognized reasoning. Does not reason as well as emotion enter into all valuable intuitions, whether in science, art, or literature? It is easy to point out examples of incorrect observations, fallacious reasoning, and false conclusions in the history of science, but are intuitions more free from error? Which is the safer guide in affairs of everyday life—in business, farming, industry, medicine—science or intuition? The value of intuitions is not in their superiority to reason but in their service as hypotheses to be tested by accurate observation, experiment, and rational deduction.

Macneile Dixon says, "The failure of science is to minister to the needs of the soul; the failure of religion is to meet the needs of the intellect"—which means that they have different aims and are not therefore in necessary antagonism. Both science and religion are necessary to minister to the needs of men, and therefore neither should attempt to impugn the aims of the other. Where conflicts arise be-
between the two, they are due principally to attempts to extend the methods of one of these disciplines to the other. The satisfactions of the intellect and the satisfactions of the emotions are reached by different routes. The route of science is through verified and exact observations and strictly logical deductions as free as possible from emotions, but such methods would not lead to the production of great art, literature, or religion. On the other hand, the exaltation of the emotions and the subordination or elimination of exact methods of observation and deduction would not produce great science. "Logic does not help us to appreciate art, nor mathematics love" (Dixon). Poetry is not the mentor of astronomy nor religion of chemistry. I once heard Clarence Edmund Steadman compare the scientific description of an equinoctial storm with the poetic account of the same phenomenon. The Weather Bureau's report read: "An area of low barometric pressure over the north Atlantic states and high pressure over regions to the south was followed by strong southeast gales with high seas," etc. Longfellow reported the same phenomenon in these words:

When descends on the Atlantic  
The gigantic  
Storm-wind of the equinox,  
Lanward in his wrath he scourges  
The toiling surges,  
Laden with seaweed from the rocks.

Winds and waves are personified and their action pictured in pleasing language. Both reports deal with the same phenomenon but with different aims. Science attempts to record events and their causes as established by careful observations and rational deductions; poetry and art appeal to the emotions through pleasing forms, symbols, rhythms, and imaginations.

Through many centuries objective science has met the
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opposition of subjective emotions, and new knowledge the antagonism of old traditions, popular beliefs, and mystical intuitions, but never has inner consciousness or emotional conviction or intuition overthrown objective reality, never have pleasant fancies destroyed stubborn facts. In spite of ancient cosmogony and theology, the earth is not flat nor the center of the universe; in spite of Galileo’s inquisitors, the world does move; in spite of the creation story of Genesis, the world was not made in six days; in spite of the impassioned convictions of some preachers and rural legislators, evolution is a fact; in spite of the intuitions of astrologers and spiritists and mystics, objective science and scientific methods stand fast.

2. OBJECTIVE AND SUBJECTIVE PHENOMENA

Of course subjective phenomena are real in that they exist, albeit in inner consciousness, and as real phenomena, there are scientific ways of dealing with them. The objective causes and results of feelings, emotions, and desires may be explored by observation and experiment, and the ability of human beings to compare their subjective experiences opens a way to their scientific study. If we had no means of expressing our feelings, thoughts, and aspirations, and no way of comparing our own feelings with those of others, there would be no way of dealing scientifically with subjective phenomena.

(1) Realistic and Idealistic Philosophies. As a scientist I am what I suppose philosophers would call a “naïve realist,” that is, I regard the external world as real and I think that objects are what they seem to be unless by scientific methods it can be shown that they are otherwise. At the same time, I realize that “what they seem” means what they seem to me and to others like myself who become aware of
the external world through our various senses and mental processes; and if one should choose to carry this admission "to its logical conclusion," and to disregard or discredit objective evidence, which I do not choose to do, it might lead to an idealistic philosophy that denies the reality of an external world or the possibility of arriving at a knowledge of it through sensory experience, and hence to a repudiation of science and its methods. Such a philosophy cannot be lived; it cannot be put to the test of experience because it repudiates the data of experience as a guide to reality. It is of interest to a scientist chiefly as an example of one of the many systems of philosophy which may be built up by logical processes upon premises that are unreal as judged by common experience. The philosophy of idealism is one of the many systems which seek to harmonize the objective and subjective aspects of human experience.

A realistic criticism of pure idealism has been expressed in the well-known limerick:

There was a young man who said, God
Must think it exceedingly odd
That the sycamore tree
Just ceases to be
When there's no one about in the Quad.

To which a theistic idealist is supposed to have replied:

Young man, your astonishment's odd,
I am always about in the Quad,
And that's why the tree
Continues to be
As observed by, Yours faithfully, God.

Thus a possible basis for pure idealism may be found in the all-inclusive ideal of an omnipresent God in whom all things exist and who is the only reality. But such a philosophy virtually denies objective reality and therewith all science.

I shall try to avoid the "holy jungle of transcendental metaphysics" (Swinburne), and shall seek a way through
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the maze of philosophy by following the Ariadne thread of scientific realism, that is, by trusting the testimony of our senses and experiences unless and until they are proved to be untrustworthy.

But in the very fact of observing, comparing, and reflecting I am consciously or unconsciously recognizing the gulf between my subjective self and the objective world. This contrast between subject and object, the ego and the world, is fundamental in all conscious experience, and no entirely satisfactory bridge over this gulf has ever yet been constructed, although many attempts have been made by ancient and modern philosophers. Plato and Descartes concluded that it was unbridgeable, and that there is a fundamental duality in nature, but many modern philosophers and almost all modern scientists maintain the essential unity of the whole of nature. In common with these scientists and philosophers, such as Alexander, Dewey, Whitehead, William Temple, Archbishop of York, I am convinced that the reasoning, self-conscious personality has developed out of the unconscious biological organism or germ under the influence of environmental stimuli, and that body and mind are aspects of one and the same nature.

(2) The Unity of All Nature. The whole trend of modern science is toward a unitary conception of all nature—a real universe instead of a duoverse. Physicists once thought of matter and energy as distinct entities; it has now been demonstrated that matter can be converted into energy, and probably also energy into matter; both are real and distinct, but interconvertible. In chemistry the ninety-two elements were formerly supposed to be absolutely distinct; now they are known to be genetically related. Life was formerly regarded as separated from the non-living by an unbridgeable gulf; but now viruses, bacteriophage, and filter-
passers appear to be closing this gap. Fundamental dualism of the living and the not-living is still maintained by vitalists, but is doubted by most biologists.

Body and mind were until recently regarded as belonging to different universes. Recall the old quip, "What is matter? Never mind. What is mind? No matter." But genetic, experimental, and pathological psychology demonstrate the intimate union of body and mind, and lead to the conclusion that their interrelations are those of structure and function. It is highly significant that in most universities at present psychology is no longer classed with philosophy, but with the natural sciences.

The chief thesis in Professor Bowman's book, *A Sacramental Universe*, is that all nature, living and not living, conscious and unconscious, consists of "a prior union of physical and subjective systems . . . which reveals itself either as embodied spirit or as living body." This seems to be a form of monism or animism, which endows all nature with the promise and potency of life and mind and spirit. So far as I can see, it is scientifically unassailable.¹

All such philosophies—dualism, idealism, monism—are primarily attempts to harmonize and rationalize the objective and subjective aspects of human nature, and only secondarily are extended to the universe at large. Professor Broad of Cambridge University has listed some seventeen hypotheses which have been advanced to explain the relations of mind and body, the ego and the world. You will not expect me, a "peeping scientist," to evaluate these, nor to present a new hypothesis to explain this mystery upon which philosophers from the Greeks to the moderns have expended their utmost mental efforts. Instead I have at-

¹Elsewhere Bowman rejects monism and adheres to duality of the physical and the spiritual (see pp. 9 and 10 of his book).
tempted to indicate how a biologist looks upon this age-old problem through the lenses of development; for it is plain to the biologist that both body and mind have developed together as structure and function, not merely in ontogeny, but also in the course of phylogeny.

3. CONFLICTS BETWEEN EMOTION AND REASON

Reason, philosophy, and science are relatively recent developments in the human race; they go back a few thousand years at most, while the human family, the Hominidae, is at least a million years old. During this million years there has been a wonderful development of the cerebrum and of mental functions; but, as just remarked, the growth of objective science and that of strictly logical and rational habits of thought are limited to a few thousand years, while the methods of modern science, based upon carefully verified observations and adequately controlled experiments, are only a few hundred years old, and are known and practiced by only a few individuals out of the great mass of mankind. The ability to generalize and to draw logical conclusions, which processes are fundamental to philosophy, are among the latest developments in phylogeny and ontogeny, and the advent of science and scientific methods is the very latest step in this process. It is no wonder that these have reached and influenced so small a number of human beings.

This is sometimes called an age of reason and of science, but in reality it is anything but that. The majority of mankind have barely begun to be rational about things that most seriously concern them, and, as to the use of the scientific methods of exact observation and experiment with adequate controls, they know practically nothing. The affairs of men are directed and determined by emotions rather than by reason or science, and the biological explanation of this is
that they are more fundamental. Differential sensitivity and reactivity are found in all animals and plants and are fundamental characteristics of all protoplasm, but intelligence is limited to animals that can learn by experience; and reason, or the ability to make general comparisons, is probably found only in man. Feelings and emotions are immensely older than reason, and they are accordingly much more potent in shaping behavior. Those who exalt emotion over reason are all unconsciously exalting the animal way of life rather than the distinctively human way. Dogs, cats, horses, and higher animals in general manifest the same kinds of emotions that human beings experience. Fear, suffering, conflict, fight, joy, affection, fidelity, even responsibility, are manifested in greater or less degree by some animals. Considering such behavior, one can understand the saying of George Eliot, "The more I see of dogs the less I think of men." But of course these emotions of animals, while similar in kind, differ in degree from corresponding emotions of man.

A neighbor of mine, a professor of philosophy, who had never actually studied the real behavior of animals, held the usual opinion of the total difference in psychical characteristics between animals and men. But, after a little fox terrier had been adopted into his family, he used to tell me with astonishment and admiration of the human-like behavior, intelligence, and emotions of his dog. It was a constant source of wonder to the philosopher, and in the end I think he would have been inclined to attribute a genuine thinking and feeling soul to his dog. We have generally underestimated the many psychical qualities of higher animals. When a sophisticated biological student once asked my old professor, W. K. Brooks, why he treated his dog as if he were human, the professor replied, "If he has feelings
similar to my own, it would be cruel to treat him otherwise; if he does not have such feelings, it will do no harm to treat him as if he had."

The popular opinion that biologists generally are cruel, bloody vivisectors of "man's best friend" is a mistake. There are many heartless egoists of the old school of philosophy which regards man as the only creature with a mind and soul, who cruelly cause animals to suffer; but where there is one biologist of this kind there are multitudes of common people who constantly beat, injure, and kill innocent animals. When a friend of mine once protested against the cruel beating of a donkey by a driver in Italy, he replied, "But he's no Christian!" The Dean of the Episcopal Cathedral of Denver, who was a great fisherman, is said to have maintained that the hooked trout leaps and plunges for joy; probably the joy of the fisherman rather than that of the fish. Think of the senseless, useless, horrible suffering that men and women are constantly inflicting on animals—shooting and killing in mere blood lust, wounding and leaving to die in what must be great pain, leaving for days in steel traps until the poor creatures gnaw off their trapped legs or die in agony—and then say whether the animal experiments of physiologists, carefully planned for making discoveries that will relieve human suffering, and carried out, as surgical operations on man are—say whether they deserve the violent condemnation of those very persons who are so callous with regard to the sufferings which they inflict without any comparable purpose. The biologist, more than any other one, is in a position to know and appreciate the pleasures and pains, the joys and sorrows, of his humble fellow creatures, and it is one of the strong claims of biology for a place in all systems of education that it, more than any other science, teaches sympathy with everything that lives.
Of course there is a difference between such sympathy and mawkish sentimentality. Man’s dominion over the fowls of the air and the beasts of the field gives him power and right to use them for his own welfare; for there is no altruism in nature that extends beyond the limits of a species to its own disadvantage, or that can supplant regard for one’s own species. But man’s larger knowledge and wider sympathies should guarantee humane treatment of all his fellow creatures.

The emotions of men are not only older and more potent, but they are much more uniform, than their reasonings. Indeed the latter are proverbially different; “Many men, many minds”; “When doctors differ who shall decide?” Such differences are usually the results of various emotions, opinions, beliefs, and not of real knowledge based on scientific evidence. In most concerns of life, scientific certainty is not possible; we conduct our lives on the level of probabilities of a high or low order, and what seems highly probable to one person may seem doubtful or improbable to another. Consequently, opinions and beliefs differ widely among men. But emotions are much more uniform, and when it is desired to bring about uniformity of opinion and action, appeal is generally made to the emotions rather than to verifiable evidence, as is seen in propaganda for or against war. We could not, even if we would, eliminate emotions in the conduct of our lives, but they should not be allowed to supplant or control intelligence and reason.

Reason is fallible in proportion to its admixture with emotion and its lack of factual basis. Because of this, Havelock Ellis has said that the most reasonable thing is to avoid too much confidence in reason. But a much more needed warning is to avoid too much confidence in emotion. Consider the man-made woes of the world—class conflicts,
national and racial antagonisms, wars—and say whether they do not arise from fear, pride, hate, aggression, rather than from factual and rational thinking. Consider the mental disorders that fill our asylums and overflow throughout the general population—emotional instability, hysteria, delusions, religious mania, insanity; all of them represent exaggerated development of emotions and subjective phenomena in general, and a lack of rational and objective control. Mankind in general seems to be possessed by every possible delusion, superstition, absurd belief, which are wholly without factual or rational basis. As Dixon says, "There seems to be a maggot in every human brain," the maggot of irrationality.

When the late William Morton Wheeler and I, in 1914, saw something of the magical ceremonies and wild corroborees of Australian aborigines, the ghastly wounds and punishments which they inflict on themselves, and learned of their crazy ideas regarding birth, life and death, ghosts, demons and magic, Wheeler said that this most primitive human race demonstrated that mankind was originally insane. I think rather that these aborigines, together with multitudes of persons of other races, demonstrate that the human species has come out of a non-rational and emotional mental condition, and is slowly emerging into a life of reason, but the animal inheritance is still strong in all of us.

Emotions are highly contagious. A dog fight sets all the dogs in the neighborhood into a fighting mood. A colony of chimpanzees goes into a frenzy of fury when any member of the colony is punished or makes an outcry. They howl, yell, and rage around in wild emotion, which looks and sounds for all the world like the ravings sometimes heard in a lunatic asylum. The two are indeed essentially similar, for they represent emotion uncontrolled by reason.
There are many evidences that the cerebrum is the principal seat of rational processes, while the lower centers of the brain are chiefly concerned with the vegetative, instinctive, and emotional processes. Bard has found that cats from which the cerebrum has been completely removed may live for months, carry on their vital functions of nutrition, respiration, circulation, even mating and production of young, but they show little or no initiative and almost no control of emotion. If the tail of a decerebrate cat is pinched or the fur rubbed the wrong way it flies into a rage and squalls, scratches, and fights.

One of the important functions of the cerebrum is to act as a brake on such basal emotions, to initiate, inhibit, and regulate behavior, and thus to bring about a balance between emotion and reason. The conflicts between reason and emotion are largely the result of a lack of proper balance between the two. All life is a balance between contrasting forces or principles, whether it be the life of plants, animals, or men. All living consists in preserving balance between the organism and the milieu, between heredity and environment, anabolism and catabolism, structure and function. Human life at its best is a proper balance between body and mind, emotion and reason, the material and the spiritual. The destructive conflicts between reason and emotion are caused by a lack of balance between the two, and not between reason and emotion as such, but rather between false reasoning on the one side and purely animal and unethical emotions on the other. There is no irrepressible conflict between the true and the good, the intellectual and the spiritual, the real and the ideal. On the contrary, they can be brought into harmonious balance and cooperation, as has been demonstrated in many well-balanced persons and social groups. The chief function of science is to
cultivate reason and to know the truth, that of religion is to cultivate the emotions and ideals and to promote harmony.

Let knowledge grow from more to more,
But more of reverence in us dwell;
That mind and soul, according well,
May make one music as before.

(1) The Various Satisfactions of Life. All animals seek the biological satisfaction of hunger, thirst, sex, and physical comfort. These are universal among animals and men. In social animals there are the additional needs and satisfactions of association and mutual protection, that is, "the herd instinct." All of these man shares with his humbler fellow creatures, and in addition he has the desire of social approval and the fear of disapproval, ambitions for power or wealth or superiority, and multitudes of other social desires that are chiefly the results of education and social environment.

In addition to these biological and social satisfactions, man experiences unique satisfactions of an aesthetic and ethical character. Types of aesthetic and ethical satisfactions depend in large part on social environment and education, as is shown by the great variety and even contradictory character of these. What is considered beautiful and desirable in one age and place is often deemed ugly and undesirable in another. Some persons derive pleasure from harmony in music, others from disharmony. Forms of art and literature that are prized by some are disliked by others. In similar manner, what is regarded as ethical under certain conditions is wholly unethical under others. In times of war, all peace-time codes of ethics are modified or abolished, and aggression, destruction, slaughter are sources of intense satisfaction. This shows that ethical satisfactions or dissatisfactions are dependent in large part upon social conditions and individual habits acquired largely by training.
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Such diversity in forms of aesthetic and ethical satisfactions and dissatisfactions does not prove that there are no standards of values, nor that either west or "east of Suez the best is like the worst," but it does show that, in human estimation and practice, values are relative and not absolute. In this respect, science occupies no position of superiority; its findings are never to be regarded as absolutely true or false, but rather as approximations to truth. Absolute truth, beauty, goodness are ideals which have never yet been reached by man, but toward which mankind is advancing through innumerable trials and errors.

(2) Science and Values: Science and Ethics. It is often said that science has nothing to do with values; one might as well say that intelligence and reason have no relation to values. What are values but means and measures of satisfaction? It is impossible for a scientist, or any one accustomed to deal with evidence or to face reality, to appreciate the statement that science has nothing to do with values. It has certainly created innumerable conveniences and comforts, it has controlled diseases and pestilences, relieved suffering, and prolonged life. It has destroyed horrible superstitions such as witchcraft and demoniacal possession. It has enormously enlarged the experiences and the thoughts of men, and has made possible wider associations and closer cooperations among nations than were ever possible before. The fact that these possibilities have not yet been fully realized or have been abused is no denial of their value.

Values are means and measures of satisfaction, and they are compared by reason and judged by experience, which alone is able to judge the value of values. Intelligence and reason distinguish between physical, mental, and social satisfactions, between those of a purely temporary kind and the enduring satisfactions of life, between the selfish satis-
factions of the person and the ethical satisfactions that come from the welfare of others. Experience and reason are the only means by which we are able to evaluate the various kinds of satisfactions, that is, the value of values.

The ethics of science regards the search for truth as one of the highest duties of man; it regards noble human character as the finest product of evolution; it considers the service of all mankind as the universal good; it teaches that human nature and humane nurture may be improved, that reason may replace unreason, cooperation supplement competition and the progress of the human race through future ages be promoted by intelligence and good will.¹

In all these respects the ethics of science does not differ from the ethics of Christianity. The fact that neither of these has yet revolutionized human behavior is no fault of the system of ethics proposed, but is due to the slow progress of human nature. The advancement of scientific knowledge has had a profound influence on the advancement of ethics, and will probably have a still greater influence in the centuries to come.

4. WAYS OF ESCAPE FROM HARD REALITY

Science seeks to distinguish truth from fiction, reality from unreality. But truth does not always bring satisfaction; often it is just the reverse. While knowledge brings power, it does not necessarily bring happiness. The writer of Ecclesiastes said, "He who increaseth knowledge increaseth sorrow." It may destroy our fondest hopes and most cherished beliefs, and consequently we often cling to our beliefs when evidence and reason show that they are false. We try to delude ourselves by saying that reason is fallible, and emotion and intuition are better guides. We

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shrink from the hard reality of truth and seek satisfaction in the soft comfort of fancy. Mankind in general is engaged in substituting fiction for fact, idealities for realities; it "prefers to believe," its thinking is wishful thinking. The more desperate the reality, the greater is the desire to escape from it.

(1) Dream Life Versus Real Life. One hundred years ago Bulwer-Lytton wrote a story (Pilgrims of the Rhine) of a poor, forlorn, and wretched man who had found surcease of sorrow in his dreams, and whose dream-life gradually replaced his waking life to his great satisfaction. Each night he took up his dream of wealth, position, friends, loved ones; each day he awoke to misery and longed to return to his pleasant dreams, until finally his real life came to an end in death.

This story is a sort of parable of all human life, much of which is sordid, sad, terrible. Men seek relief in dreams, waking or sleeping, often by means of narcotics, alcohol, opiates. The hard facts of life are covered over with pleasant fancies, the grim realities dissolve into charming idealities. But the dream does not last, and the real life is often made more hard and miserable than ever.

Pleasant fancies and fairy stories do no harm when they are recognized for what they are, or when they do not replace reality. Santa Claus as a symbol of the Christmas spirit is a popular saint, and we can applaud the editor who wrote to the little girl, "Yes, Virginia, there is a Santa Claus," for we know the fable is only half believed and will soon be replaced in her mind by the reality which it symbolizes. As we grow older we abandon childish fancies, but accept others that are just as unreal. Folklore, superstitions, magic are invented in order to explain mysteries or to escape from reality. We cover up a world of bitter reality with an imaginary one of pious make-believe.
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(2) *The Beneficence of Nature Versus Reality.* Among these pleasant fancies is the belief that the earth was made for man and stored with oil, coal, and metals for his use; that grass and grain and fruits were made to grow for him; that flocks and herds were scattered over a thousand hills for his benefit. We fancy that no weeds or brambles grew in the earthly paradise and that Adam had an easy time of it before he had to make his living by the sweat of his brow.

But all such fancies take no account of reality. The utter indifference of nature to man and his welfare, as shown in earthquakes, hurricanes, floods, droughts, deserts, jungles, eternal ice, famines, and pestilences, are overlooked in these pleasant reflections on the beneficence of nature. The cruelties, sufferings, and deaths that are inflicted on sensitive and harmless animals by ferocious beasts and birds of prey, are forgotten or sublimated into a poetic belief,

That not a worm is cloven in vain,
That nothing walks with aimless feet.

It takes more faith than a biologist can muster to believe that. At best a realist can say that these animal victims are generally spared the agony of anticipation.

Over against nature’s marvellous mechanisms for preserving life and health stands the infernal ingenuity of parasites that destroy both; balanced against the health and happiness of youth are the sorrows and ills of age. Any idealist who talks of the “beneficence of nature” should consider the millions of human beings condemned through no conscious fault of their own to the horrible sufferings of cancer or the hopeless shadows of insanity. Those who consider such things as unreal and existing only in “mortal thought” are to be congratulated on their ability to escape from hideous reality.

Nature is no *alma mater,* no tender mother; she says to
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every living thing, "Root hog, or die!" All must adjust to her rigors or overcome them as well as possible. In short, nature is neither good nor bad, but is full of possibilities for both. Man must cultivate his garden, or weeds and brambles will overrun it. He must remake the world to suit his convenience, bridge chasms and rivers, tunnel mountains, and cut canals through isthmuses which nature thoughtlessly left between oceans. He must learn to control floods, conquer diseases, prevent pestilences and famines. In short, he must work out his own salvation.

(3) Philosophical and Theological Ways of Escape. We have already considered those systems of philosophy, such as idealism and solipsism, monism and animism, which attempt to eliminate the antithesis between the subject and the object, the ego and the world, and thus to remove the conflict between the real and the ideal. There are likewise theological philosophies, such as transcendentalism, pantheism, divine immanence, which undertake to transcend, idealize, and spiritualize nature, and thus to escape from the apparent evils of reality.

There are in addition many theological creeds, doctrines, and practices designed and intended to give comfort and hope to sufferers from hard reality, and to inspire courage and strength to overcome evil with good. Among these are beliefs in heaven and hell in a future life. The joys of heaven compensate for the woes of earth,

    Earth has no sorrow that heaven cannot heal.

Even "that blessed belief in hell" and the eternal punishment of the wicked satisfies our demands for justice which are often denied us in this life.

The doctrines of foreordination, denial of free will, and even belief in fixed fate are often a blessed relief from an overwhelming sense of personal responsibility. Likewise the
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ability to throw all responsibility in matters of faith and conscience upon a church or priesthood is a blessed comfort to many perplexed mortals. Such theological doctrines do not have nor claim to have their origin in objective science. They are articles of faith based on revelation and inspiration intended to provide ways of escape from some of the bitter hardships of objective reality.

In these days of national and racial hatred and of wholesale destruction and murder, there is more than the usual excuse for belief in the existence of an infinitely malevolent and almost omnipotent Devil. But science has robbed us of the comfort of throwing all the discord of this troubled world on his Satanic Majesty. Even in modern theology he seems to have fallen from his once high eminence when he seemed more potent in this evil world than God himself. Accordingly, the horrors of war are often regarded by orthodoxy as divine punishments for the sins of men, albeit the punishment falls upon millions of innocent victims. Some church hymnals still echo this belief in a grand poem set to the music of the Imperial Russian Anthem:

God, the All-Terrible! thou who ordainest
Thunder thy clarion, and lightning thy sword;
Show forth thy pity on high where thou reignest;
Give to us peace in our time, O Lord.

The doctrine of original sin, which threw upon Adam the responsibility for the sins of the whole human race, was a comfortable way of escape from the reality of our own personal responsibility, but it is no longer very popular. It seems more true to fact to realize that “man’s inhumanity to man” is more frequently the result of bad environment and bad education than of bad heredity.

(4) Ways of Escape from the Reality of Death. Perhaps no other flight from reality has ever been so agonizing and
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so universal as the attempted escape from the actuality of death. In every age and land, men have tried every possible device to deny its reality or to hide its horrors. The dead body has been preserved by all possible means and has been laid away with its accustomed weapons, utensils, food, against the day of resurrection, when the spirit and life would return. For thousands of years the mummies of Egypt have awaited that resurrection, only now to be exposed in museums or to be ground up for fertilizer or made into paint and varnish.

We say with St. Paul, "By sin came death," forgetting that physical death came ages and ages before man appeared. Trilobites and ammonites, dinosaurs and titanotherees lived and died and became utterly extinct many thousands or millions of years before man appeared on earth. Unknown generations of proto-human beings lived and died and left their remains in the gravels of Trinil or the cave at Chou-kou-tien; countless generations of men of the old stone age lived and died and left only their bones and implements before the advent of Homo sapiens. Evidently it cannot have been the sins of modern man that first "brought death into the world and all our woe."

Saints, prophets, philosophers, and poets have found a way of escape from the reality of death through faith in the immortality of the soul. In this faith St. Paul cried,

O death, where is thy sting?
O grave, where is thy victory?

In this faith Longfellow wrote,

There is no death! What seems so is transition;
This life of mortal breath
Is but a suburb of the life elysian,
Whose portal we call Death.

This is a glorious faith, a conquering hope, which I would gladly share, but I am not aware of any sound scientific
evidence in favor of this belief. The seances of the spiritists in their darkened rooms and mysterious cabinets, and the anecdotal evidence of psychical research, leave most scientists cold and unconvinced. Belief in the immortality of the soul is based upon faith, and not upon scientific evidence. Indeed, such factual evidence as exists is negative and we may well cry,

O star-eyed Science! hast thou wandered there,
To waft us home the message of despair?

But there are other forms of immortality for which there is strictly scientific evidence, and although these do not satisfy our personal longings for persistence of consciousness, they seem to me to be finer and more ethical than the concept of a personal and sensuous immortality. One of these is biological immortality through our children and our children's children. This is a form of immortality that is highly regarded in the East but has been too much neglected in the West. We know that the stream of life in which we are eddies, has flowed out of the distant past, and without a break will go on through us to our latest descendants. In us our fathers and mothers and most distant ancestors live today, and in our children we will continue to live to their last generation. This is no theory, but absolute fact, for while the stream of consciousness is broken between generations, the stream of life is not.

Another form of persistence for which there is convincing evidence is social immortality. Men do not die and leave only their bones and implements, but “they rest from their labors and their works do follow them.” Civilization is the product of the labor and influence of millions of persons, most of whom are wholly unknown to us. Only a few have achieved immortal fame, but many have left their immortal influence. Our lives have been shaped and moulded
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not only by heredity, but also by environment, not only by the germinal elements of personality which we inherited from our parents, but also by the actual personalities that surround us. Every person radiates influences to every other one with whom he comes in contact, either directly or indirectly, and our characters are, to a considerable extent, the product of such influences. Heaviside, the English physicist, said on this theme:

A part of us lives after death diffused through all humanity. The souls of a Shakespeare or Newton are stupendously large. Such men live the best part of their lives after they are dead. Maxwell is one of these men. His soul will live and grow for a long time to come and hundreds of years hence will shine as one of the bright stars of the past, whose light takes ages to reach us.

Many of the greatest men and women of the past left no children of their bodies, but the world is filled with the children of their minds and souls. We are the intellectual and spiritual children of philosophers and poets and scientists of former ages, of Socrates and Plato and Aristotle, of the prophets, apostles, and martyrs, and especially of that most influential character in all history, Jesus Christ. In us these great spirits live again, and in future generations may we also live again in our spiritual children! This social immortality of thought and deed has been nobly expressed in that well-known poem by George Eliot:

O may I join the choir invisible
Of those immortal dead who live again
In minds made better by their presence: live
In pulses stirred to generosity,
In deeds of daring rectitude, in scorn
For miserable aims that end with self,
In thoughts sublime that pierce the night like stars,
And with their mild persistence urge man's search
To vaster issues....

This is life to come,
Which martyred men have made more glorious
For us to strive to follow. May I reach
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That purest heaven, be to other souls
The cup of strength in some great agony,
Enkindle generous ardour, feed pure love,
Beget the smiles that have no cruelty—
Be the sweet presence of a good diffused,
And in diffusion ever more intense.
So shall I join the choir invisible
Whose music is the gladness of the world.

These forms of immortality may be small comfort for egoists who look forward to an endless life of conscious pleasure, but they should give us a greater interest in the future of mankind and increased desire to be found worthy to share in that future.

5. REALISM WITHOUT IDEALISM LEADS TO PESSIMISM

And here we return to the antithesis between science and faith, knowledge and desire, the real and the ideal. Science seeks to know the truth, even though it may be unwelcome. "Truth is truth, even though it sears our eyeballs" and destroys our hopes. It was this conflict between the real and the ideal, between emotionless science and pleasant tradition that led Wordsworth to write,

Great God! I'd rather be
A Pagan suckled in a creed outworn,
So might I, standing on this pleasant lea,
Have glimpses that would make me less forlorn;
Have sight of Proteus rising from the sea,
Or hear old Triton blow his wreathed horn.

The fact that nature is indifferent to our weal or woe, that disease, suffering, and death are the portion of all, that man's inhumanity to man frequently makes a hell of earth—these facts, if there were no escape, would necessarily lead to pessimism and despair. Such a philosophy of despair is not confined to scientists, but is found among all those who see in human life only aimless suffering and
evil with no faith in progress and no hope for the future. It led Mark Twain, near the end of his life, to write:

A myriad of men are born; they labor and sweat and struggle for bread; they squabble and scold and fight; they scramble for little mean advantages over each other. Age creeps upon them; infirmities follow; shames and humiliations bring down their prides and their vanities. Those they love are taken from them, and the joy of life is turned to aching grief. The burden of pain, care, misery grows heavier year by year. At length ambition is dead; pride is dead; vanity is dead; longing for release is in their place. It comes at last—the only unpoisoned gift earth ever had for them—and they vanish from a world where they were of no consequence; where they achieved nothing; where they were a mistake and a failure and a foolishness; where they have left no sign that they have existed—a world which will lament them for a day and forget them forever. Then another myriad takes their place, and copies all they did, and goes along the same profitless road, and vanishes as they vanished—to make room for another and another and a million more myriads to follow the same arid path through the same desert, and accomplish what the first myriad, and all the myriads that came after it, accomplished—Nothing!

If it be true that "he that increaseth knowledge increaseth sorrow," and that the only way to be happy is to forget, or to shut one's mind to reality, then Jacques Loeb was right when he once said bitterly to me, "The evolution of consciousness was the greatest blunder in the universe"—meaning that if only we had remained unconscious it would not have mattered that there is no plan or purpose in nature or in human life and that death ends all for the individual and the race.

But such pessimistic views of man and of human prospects are not justified in reality. They represent a partial and defeatist view of "the human situation." Neither Mark Twain nor any other philosopher of despair could avoid the urge to work for human betterment. The deeper currents of their lives run counter to these eddies on the surface. Laborious days and thoughtful nights reveal their faith in human worth and progress, and their despair indicates chiefly their discontent that progress is so slow.
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It is impossible to live such a philosophy of negation, a philosophy of despair and suicide, rather than of hope and life. Surely there must be something wrong with any philosophy that cannot be lived. In science, the test of reality is not logic or philosophy, but the appeal to fact, and the practical test of any system of philosophy should be its livability.

(1) *Reason not at Fault.* Let us go back and see where we took the trail that led to this slough of despond. Certainly it was not in following the light of reason in dealing with these great problems, for although we may with Darwin doubt whether the mind of man can be trusted when it draws such grand conclusions, it is not reasoning itself that is at fault, but imperfect reasoning. Reason may be "but a feeble flame by stumblers carried in a starless night, and yet it is our only light." Even revelation must be interpreted by reason, and those who advise us in the interest of preserving our childhood's beliefs to "take our reason captive" are counselling what is not only impossible but also positively irreligious, for we are commanded to worship the God of truth with all our mind, as well as with all our heart. Will any fundamentalist maintain that we alone of all living creatures were given reason to deceive us and to lure us to destruction? The old war cry against rationalism will no longer avail; we will not be frightened by names. No, we have not strayed from the highway of truth into this morass by following sound reasoning, but rather by following faulty mental processes that will not bear the test of actual experience. The only remedy and substitute for poor reasoning is better reasoning, and not its total elimination.

(2) *Science not Responsible.* We have not departed from the highway of truth by accepting the findings of science regarding the immensity of nature and the smallness of man.
The sciences of astronomy, geology, and biology have so enormously enlarged our views of the universe that space and time have become practically infinite and the days of creation have become billions of years. This enlargement of nature has led to a corresponding shrinkage of man when measured by standards of space and time; but when measured by reason, conscience, aspiration, it is a different story. For the first time in the long history of life on this planet there has appeared in man a creature capable, to a certain extent, of understanding and measuring this wonderful universe and of controlling some of its processes. By this measure, man is not an insignificant creature; the magnitude of the universe has not dwarfed the mind and soul of man.

The teachings of biology as to the animal ancestry of man, or as to his development from germ cells, have not degraded man and produced this utter pessimism. All the greatest leaders of mankind were once babies, and before that germ cells, and often they have had neither distinguished parents nor notable offspring. Lowly origin is not incompatible with ultimate greatness, as none know better than the countrymen of Franklin and Lincoln. Nature and human history proclaim the fact that superlative greatness may have very humble origins. The worth and dignity of man consist in what he is and in what he may become.

Evolution deals only with mechanisms and processes, and does not touch the question of ultimate causation. The greatest problem here is not the mechanism of evolution, but the evolution of this mechanism. In all human experience, mechanisms and machines do not create themselves. What lies back of these mechanisms of evolution, and indeed of all nature, no one knows. The atheist sees only chance and accident. The theist sees back of all mecha-
nisms and laws, divine power and plan. The Christian sees a Heavenly Father. Science cannot deal with this mystery; it is a matter of faith and ideals.

It was objected to Newton's law of gravity that it drove God out of his universe and put a law in his place. The same objection has been made by many opponents of evolution; and yet a natural law is only a "stated, fixed, settled" method or process, and surely there is no more evidence of divine power in a chaotic and capricious universe than in an orderly and lawful one. On the other hand, if the universe were a chaos instead of a cosmos, it might be taken to mean that everything is the result of chance. The very existence of order in nature seems to imply some other governance than chance. But while nature is "stated, fixed, settled," its determinism is not predeterminism. Determinism means that every event is the result of a chain, or rather a network, of preceding causes; predeterminism attributes every event to a single original cause; the one is scientific determinism, the other fatalism. From every source, evidence is accumulating to show that natural events are not rigidly fixed and predetermined. Even in the more exact sciences of physics and chemistry there is, as Charles Galton Darwin has recently said, a certain "fuzziness" or variability in all phenomena. This is much more apparent in living things where the network of cause and effect is very complicated, and events correspondingly much more variable.

These same considerations apply to human life and activity as well as to the outside world. There is no sufficient evidence that the body, mind, or morals of man are wholly the results of caprice or chance, nor, on the other hand, that

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1Bishop Joseph Butler's definition of Nature in his *Analogy of Natural and Revealed Religion*. 
they are absolutely predetermined. The determinism of heredity and environment is not predeterminism, and in the case of man it is certain that it does not destroy all freedom and responsibility. As a matter of fact, we know that our wills are not perfectly free. Heredity and early environment have set bounds about us that we cannot pass, but within those bounds we have a certain amount of freedom and responsibility. We are partly bound and partly free. Within certain limits we may be held responsible for making right choices between alternatives that are offered, but we cannot directly make the alternatives nor always choose between them. In short, human freedom and responsibility are relative and not absolute, and the truth of this is recognized in the laws and customs of all civilized countries. The concept of universal law when applied to the individual or to society does not, when properly understood, destroy human freedom and responsibility, and to this extent man is a "free moral agent."

(3) Is There Plan and Purpose in the Universe? Perhaps more than anything else pessimism and despair are caused by the thought that there is no plan or purpose in the universe or in human life, and that everything is the result of chance and accident. Undoubtedly chance, in the sense of numerous causes that cannot be recognized and formulated, has played a large part in the evolution of worlds and of organisms, but there is no scientific evidence that it has played the only or the leading part. Chance has determined many things in our lives, but there is no compelling evidence that our evolution and development have been purposeless. We know as well as we know anything that we have aims and purposes. Where did they come from? How did they develop in a purposeless universe? I cannot understand how anyone can take the long view of
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nature that science reveals, can follow the course of evolution from the formation of atoms to the appearance of man with his intellect, consciousness, and aspirations, and still believe that it is all without plan or purpose.

But it is not possible to prove that the constitution of the universe and the whole course of inorganic and organic evolution embody an original plan or purpose, nor, on the other hand, can it be proved that they are all the results of chance. We have previously seen certain evidences that life processes are essentially teleological; furthermore, the fact that higher animals, such as birds and mammals, seek satisfactions and avoid dissatisfactions shows that there is something more than mere chance involved in their behavior. We do not know how far down in the animal scale there is conscious purpose, but in man, at least, nothing is more certain than the conscious seeking of satisfaction and purposive efforts to reach certain desired ends. If there never before was any such thing as purpose in the whole universe, there is purpose now in the life and activity of at least one species, *Homo sapiens.*

Pessimists who hold that there is no plan or purpose in human life and that extinction is the goal toward which we as individuals and a race are inevitably driven, may well ask what's the use of efforts for improvement of the individual or the race? What's the use of education, eugenics, ethics, religion? What's the use of science, discovery, or invention? What's the use of ideals or goals or ends? What's the use of anything? Nothing! Utter pessimism is the outcome of such a philosophy, and death the only boon.

Here is, after all, the point from which one takes the path that leads to hope or to despair. If there is no purpose in the universe or in man, then indeed there is no God and no good. But if there is purpose in nature and in human life,
if there are ideals of truth, beauty, love, and peace to be worked for and attained, then we may conclude that it is only the imperfection of our mental vision that leads us sometimes to cry with the author of Ecclesiastes and other pessimists, "Vanity of vanities, all is vanity."

6. IDEALS AS GOALS

Ideals are not merely ways of escape from hard realities; what is much more important is they are stimuli to goals that have not yet been reached. For the first time in the long history of life on earth, there has appeared in man a creature capable of taking a conscious part in his own development and evolution. He may not be literally "Master of Destiny," but he can at least plan and work to make his ideals become realities.

All that man now has of value beyond what is found in wild nature has been gained by human effort. The whole progress of mankind from savagery to civilization has been won by the struggle to make ideals become real. The ideals that have been most potent in human progress have been those which aimed at (1) physical comfort and well being, (2) social security, order, dominance, and power, (3) individual and social freedom, (4) improvement of the individual and the race in body, mind, and morals. Science has contributed enormously to the realization of many of these aims, but it furnishes only means of progress and can influence only indirectly aims and ideals.

(1) Ethical Goals. The social conflicts, revolutions, and wars of today are struggles to reach certain goals which are thought to be better than existing realities. Many of these ideals may seem to us foolish, wicked, and destructive of all progress in freedom, ethics, and human welfare, but to their proponents they seem to be desirable goals. But
in order to reach these goals, they destroy the freedom, welfare, and lives of the people of other nations and races; their ideals are too narrowly limited to their own people. The world is cursed with primitive tribal ideals of ethics, with "cheap, vernacular patriotisms," duties being limited to particular social classes, nations, or races. Nothing less wide than a system of planetary ethics will suffice in so small a world as this.

In the course of human history, ideals of ethics have undergone slow development both in substance and in breadth of application. The crude ethics of earlier times was again and again condemned by Jesus: "Ye have heard that it hath been said, Thou shalt love thy neighbor, and hate thine enemy. But I say unto you, love your enemies, bless them that curse you, do good to them that hate you, and pray for them which despitefully use you, and persecute you. . . . For if ye love them which love you, what reward have ye? Do not even the publicans the same?" "Whatsoever ye would that men should do to you, do ye even so to them." The extraordinary advance of Christian ethics over that of the Jews and all pagan systems was shown in the very fact that it taught an ideal of universal human brotherhood, "Where there is neither Greek nor Jew, Barbarian, Scythian, bond nor free." The world has a long way to go before it realizes these high ideals, but they shine as beacon lights in a dark and stormy night.

Recently a great outcry has been raised against science because it is said to teach no ideals of values and ethics. But if there is any place where truthfulness is more prized and conscious falsehood more fatal than in science, I have yet to hear of it. If there is any occupation in which freedom is more necessary than in science, where is it? The true scientist must be free to search and to proclaim,
without fear of prejudice or authority. If there is any subject which is more dependent upon honest and honorable cooperation than science, I should like to learn of it. Where else than in science will you find in our modern world a more perfect illustration of genuine internationalism than among scientists? As an illustration of scientific internationalism I call attention to an announcement from the British Association for the Advancement of Science, dated London, February 21, 1941, of its "decision to join with American scientists in preparing a Democratic Charter of Science to be observed by scientists throughout the world. The first principle to be laid down will be that the fellowship of the commonwealth of science has service to all mankind as its highest aim, and the whole world as its outlook. The Charter will not recognize any barriers of race, creed, or class." If truthfulness, freedom, honor, humanitarianism, internationalism, universal brotherhood are not ethical ideals, there may be some ground for claiming that the methods, results, and pursuits of science are unethical and are "destroying western culture."

Two days after the announcement by the British Association of the proposed "democratic charter of science" the news from Rome carried Mussolini's speech in which he called for "that cold, conscious, implacable hate, hate in every home, which is indispensable for victory." A few days later, Popolo d'Italia, Mussolini's newspaper, carried an editorial which closed with these violent words: "We must hate England as our Roman forefathers hated the Carthaginians and as our fathers hated the Austria of the Hapsburgs. Thus with hate in our hearts we will reach total victory. Therefore, hate the enemy and God curse England!"

Is the world suffering today from too much reason, too much calm science, or too much uncontrolled emotion? Our
greatest dangers, against which we most need national defense, are such wild emotions as these. Emotionalism, sensationalism, irrationalism are our chief dangers, and unless we learn to control these by reason they will destroy us.

(2) The Need of Religion. The real and the ideal are not necessarily in conflict; they are antithetical but not antagonistic. Here, as in the antithesis between reason and emotion, there may be cooperation instead of conflict. Again, the desirable condition is one of a proper balance between them. Long ago it was said, "Where there is no vision the people perish." "Man shall not live by bread alone, but by every word of God." Both reality and ideality are necessary for happy and useful living. We must build on the rock of fact, but up into the atmosphere of ideals. Realism without idealism ends in pessimism.

It is here in the realm of ideals and aspirations, as well as in rational processes, that man is most distinct from all other animals. And it is here that one recognizes most clearly what men have generally called divine influence. The real largely refers to what is past, the solid foundation of fact, the forces of nature that drive us on. The ideal looks more to the future, to the making real of what is at present only ideal; it is the force which draws us on to better things.

The supreme social service of religion is to breathe into the realism of science the spirit of lofty idealism; to cultivate among all classes, races, and nations of men, justice, peace, and mutual service. The needs for such religion are universal and eternal. It can never be replaced, for there are no substitutes that can take its place; neither science, art, nor forms of social organization, such as democracy, fascism, or communism, can be substituted for it. It can never be outgrown, for its need is omnipresent and ever
increasing. The greater the specializations of science become, the greater are the needs of such religious integration. The spirit of enlightened religion is that of faith, hope, and love; its aim is the cultivation of truth, beauty, morality; its great purpose is to promote the progress of mankind toward the ideals of the Kingdom of God on Earth. Too often, religious organizations have minimized these social and mundane functions by devoting their major efforts to the preparation of individuals for a future life of bliss in some other world than this, neglecting the leading petition in the Lord’s Prayer, “Thy Kingdom come, Thy will be done on earth, as it is in heaven.”

Of course, in a very important sense, religion is a personal matter. Edward Caird, the great Scottish theologian, once said, “A man’s religion is the expression of his ultimate attitude to the universe.” Indeed, every man has some form of religion, however irreligious it may seem to those whose attitude to the universe is different from his own. In this sense, religion includes a man’s entire personality; his intellect, emotions, will; thoughts, aspirations, ethical principles. But a purely personal religion fails to accomplish much of a lasting nature for human society. Because of the greater power and permanency of society, all types of religion have established social organizations in which individuals are united by some integrating principle, such as common doctrines, dogmas, and creeds. Many of these ancient beliefs dealt with the nature of the world and man, and in this field they have frequently come into conflict with modern science.

To many persons, religious creeds and dogmas are peculiarly precious. In an age of scientific, social, and religious evolution they wish to preserve unchanged the faith of the fathers. This feeling is very human and understandable.
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We all want sure foundations in material, intellectual, and social affairs. Earthquakes and social revolutions are uncomfortable, if not terrifying, and yet new knowledge is continually shaking old systems of science, philosophy, and religion.

The antagonism of many scientists to religion is largely antagonism to ancient creeds. They sometimes identify religion with every absurdity or religious belief of primitive ages and stages of culture. There are also many currently accepted religious dogmas that scientists find it difficult, if not impossible, to accept. This is not so much a revolt against religion as one against the clothes in which religion has been dressed—a revolt against outworn creeds and dogmas in which men long ago clothed their religion. But, in spite of all such criticisms, the needs of a genuine spirit of religion were never more evident. The first question and answer in the old catechism is, “What is the chief end of man? To glorify God and enjoy Him forever,” which in the language of science may be interpreted, the chief end of man is to make the highest ideals become real, and thus to bless future generations.

No one can furnish scientific proof of the existence or nature of God, nor of a divine plan in the fulfillment of which men may cooperate, but it is evident that such ideals lend strength and courage to mortal men. Religious faith and ideals give the largest value to human life and the greatest stimulus to efforts for improvement. “By their fruits ye shall know them.”

7. CONCLUSION

“What is man?” Realists reply, “What is he not?” Saint, sinner; despot, slave; tyrant, victim; brute, angel; wise, foolish; sane, insane; and so on to the end of all possible
contraries. Alongside of generosity we find meanness; of sympathy, cruelty; of purity, filth; alongside of humanitarianism is "man's inhumanity to man"; in contrast to medicine, sanitation, and the saving of life are the most fiendish massacres and atrocities; the most hopeful plans for peace are met by the most destructive preparations for war.

Idealists forget realities when they picture the dignity and value of every human being. There is much unreal talk about the infinite worth of every soul. Whose soul? That of murderers, kidnappers, fiends, and devils? Unless they can be reformed and regenerated their value is negative. In similar vein there is just now much democratic fustian about the rights of every individual to perfect freedom. Whose freedom? That of robbers, gangsters, rapists? There can be no absolute freedom in any society, and for criminals it must be relatively much less than for law-abiding citizens. Idealists are right in affirming the potential worth and dignity of every person who can by any possible means become valuable and dignified, but they do not consult reality when proclaiming the actual value of every living soul.

"What is man?" The answer of the natural sciences has been presented in these lectures, and may be summarized briefly. There can be no reasonable doubt that man is a part of nature, that he has descended from earlier animals less highly developed in psychical and social qualities, and that he still bears in his entire nature the marks of his lowly origin. It is certain that in each generation he develops from germ cells, and that in body, mind, and morals he is the product of heredity and environment.

But, making all allowances for this humble origin, it is still true that man is a unique living being. He alone uses articulate speech to express ideas; he alone has the power of generalization and abstract thought, as contrasted with
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knowledge of specific things which higher animals have. He alone has a keen sense of right and wrong, of justice, responsibility, and ethics. He alone has intellectual and spiritual ideals that urge him on to vaster issues. Who more than the scientific realist can appreciate the words of Shakespeare: "What a piece of work is a man! how noble in reason! how infinite in faculty! in form and moving how express and admirable! in action how like an angel! in apprehension how like a god!"

But the realist sees also the other side of this picture. No other living species has so many congenital defects as man; no other so many botched, bungled, helpless specimens. In body, mind, and morals the highest and lowest types of men are worlds apart. Contrast the achievements of minds that have explored the depths of the universe, the constitution of atoms, the mysteries of life and mind, with the inanities and insanities of the human herd; the heroic souls that have dared great adventures, with the slaves who are but "dumb driven cattle"; the composers and creators of great music, literature, and art, with the multitude whose highest thoughts are of animal comforts; the monsters of hate and depravity, with "the Lord Christ's heart and Shakespeare's brain."

Here we have, in sharp contrast, extremes of the real and the ideal in man. But the fact that ideals have been made real in some men lends hope and inspiration to efforts for human betterment. With this sad contrast between the real and the ideal in mind, Omar Khayyam wrote:

Ah Love! could thou and I with Fate conspire
To grasp this sorry Scheme of Things entire,
Would not we shatter it to bits—and then
Re-mould it nearer to the Heart's Desire!

We cannot grasp this sorry scheme of things entire, nor shatter it to bits, but fortunately we can in many ways re-
mould it nearer to the heart’s desire. That is what man has been doing ever since he brought intelligent purpose to bear upon his problems. Ever since he first made weapons and tools and used fire and clothing, he has been moulding things nearer to his heart’s desire, and who can fix any limit upon this process? Certainly an age in which our control over environment is going forward at terrific speed is no time to despair of further progress. Even the remoulding of human character for good can be and must be achieved.

Society is in the throes of revolutionary changes which are inspired by the desire to shatter things to bits and then remould them nearer to the heart’s desire. But if such desires are not wise and just they produce ruin rather than progress. This shattering of things to bits in order to remould them nearer to the heart’s desire is the nihilist, anarchist, bolshevist, fascist, national-socialist method—the method of revolution rather than that of evolution, of tyranny and compulsion rather than of freedom and education, of autocracy rather than of democracy. All development builds on what has gone before, and not merely on its ruins. All biological, intellectual, social advance has been made in this way. Utter ruin ends in extinction, and not progress. The very fact that man can modify and shape his environment and to a more limited extent his own reaction patterns, behavior, and character, points out the possibility of moulding things nearer to the heart’s desire.

But, to be of any real effect, ideals must lead to action. Mere visions, dreams, wishful thinking accomplish nothing. Faith that will remove mountains must be put to work with steam shovels. Many persons regard faith as all-sufficient in itself, but such faith is as vain as the schoolboy’s definition, “Faith is that quality that enables us to
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believe what we know to be untrue." On the other hand, to the Apostles, "Faith is the substance of things hoped for," and "Faith without works is dead." We are commanded to "work out our own salvation," and we may be sure that, unless we put our ideals to work, they will never bring improvement or salvation.

Man cannot live and prosper without ideals, and society disintegrates without social morale. Professor William McDougall found in Borneo that "social integration was proportional to warlike habits." When dangers of foes relax, social integration decreases, and the larger society breaks up into classes, parties, labor unions, etc. Is it possible to maintain social unity and moral fiber in the absence of fear? The dictators say, No! and they obtain a kind of unity by means of force, concentration camps, and bloody purges, which destroy all real freedom. Even in our democratic society we often appeal to fear or force to bring about social unity, and of course in war individual freedom must be suspended for the time being. Indeed, real democracy works well only in times of peace.

But in times of peace and prosperity social unity is endangered by the clashing interests of different classes; strikes and sabotages multiply, party rancor increases, and cooperation by peaceful and rational persuasion sinks to a dangerous level. It seems that a certain amount of fear and hardship is necessary to bring about general social unity.

But even worse than this loss of cooperation in times of prosperity is the loss of ethical ideals and the rot of moral fiber. Decay of ideals of honesty, temperance, industry, and fidelity in all relations flourishes in those very circles that are most prosperous and have least to fear. Indeed, without deep-seated and compelling ideals of personal honor and responsibility, men revert to the animal condition, where
the higher forms of ethics decay. It seems that man cannot endure too much ease and prosperity without degeneration. Here, as in the field of physical well-being, struggle is necessary for progress. "Man is always at his best when rowing against the stream," and it seems to be true that "mankind is educible only when miserable." "Sweet are the uses of adversity." Therefore, the ideal condition is not "peace, perfect peace," but rather struggle to maintain high ideals.

Human progress must take other directions than the pursuit of wealth, comfort, luxury, even individual freedom. Our society is too much concerned with maintenance of individual rights. The American Revolution was a struggle for the rights of man—the inalienable rights of life, liberty, and happiness. We need and perhaps are now having a new Revolution to emphasize the duties of man. The ideal state of Plato was one in which each should do his duty and contribute to the welfare of others, but he would be a one-eyed philosopher who emphasized only duties, and wholly neglected rights. The growing dependence of individuals upon the state is a long step in the direction of a totalitarian society in which the individual loses his rights and freedom and becomes a pawn in a game played by dictators. The fundamental difference between autocracy and democracy is that, in the former, "the state" is one or a few individuals without responsibility to the populace; in the latter, the leaders are the free choice of the people and are responsible to them. Leaders are necessary in all forms of society, but there is a world-wide difference in the manner of their becoming leaders.

Practically all the disorders of society are man-made and can be man-cured. Aggression, tyranny, hate, war are not forced upon mankind by a cruel nature; they are purely hu-
man in origin, and it is in the power of man to control or abolish them. No doubt this will be a long and hard task, but time is long, man can learn by experience, and some men at least are brave and welcome adventure.

The long course of organic evolution justifies faith in further progress. The evolutionist knows that the great stream of life has meandered in many directions and that there have been many eddies and back currents, but he knows that on the whole there has been no permanent retreat in the evolution of intellect, reason, and ethics. There is some perfecting principle in all life and evolution, and in the case of man "some power not ourselves that makes for righteousness" (rightness). Through all the ages of man's past history, and in spite of many mistakes and failures, the current of his development has been leading to wider intellectual horizons, to broader social outlooks, and to more generous forms of ethics. In spite of wars that "threaten civilization," there is no sufficient reason to believe that this great current will cease to flow today or tomorrow. In the course of ages man will learn, by trial and error if not by intelligence and reason. We are today only children in the morning of time, and before us lie the countless centuries and millennia of man's vast future.

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