

- This article written by a noted biologist explains the nature of science as involving methods of observation, comparison, and analysis of facts and the formulation of a generalization; and it tells us the effects of science on men's habits, customs, attitudes, beliefs and ideas.

## SCIENCE AND THE FAITH OF THE MODERN

Let us briefly compare some aspects of the old faith and the new knowledge and then inquire what is the duty of forward-looking men in this age of intellectual, social, and religious unrest.

The old cosmogony, philosophy, and theology sought comfort, satisfaction, and inspiration rather than unwelcome truth. It magnified man by making him the climax and goal of all creation. It placed the earth, man's home, at the center of the universe. The sun, moon, and stars were created to give light to the earth. All things were made to minister to man's welfare. Man himself was created in the image of God, perfect and immortal.

In this old philosophy and theology supernaturalism was universal; there was no

proper conception of nature and of natural law. The earth was peopled not only with godlike men but also with manlike gods, angels, spirits, witches, demons. Some supernatural being was responsible for every phenomenon. The movements of sun and stars, the return of the seasons, wind and rain, lightning and rainbow, volcanoes and earthquakes, plagues and pestilences, were willed by some supernatural being. All nature was the expression of wills, big or little, good or bad.

The old ethics was based primarily on the will of God, supernaturally revealed in code or book, and to this certain rules were added from time to time by Church or State under divine guidance. Right was what God approved, wrong was what

He forbade, and if ever doubts arose with regard to these there were not lacking those who would interpret the will of God. Man himself was a free moral agent. No bonds of heredity or necessity rested on his mind or soul. He was the architect of his own character, the arbiter of his own destiny. All good was the result of good will, all evil of evil will, and good would be rewarded and evil punished either in this life or in an eternal life of bliss or torment.

There was enormous satisfaction in this view of the universe and of man. It not only glorified man, explained evil, and promised redemption, but it was a great stimulus to efforts for betterment and a source of high ideals and aspirations, and undoubtedly its commands and sanctions worked powerfully to preserve the ethical code. Furthermore, there was admirable directness and positiveness in the old ethics regarding right and wrong, truth and error, freedom and responsibility, rewards and punishments. There was no hazy middle ground between these, no relativity of truth

or right or duty to confuse the mind. Things were absolutely true or false, completely right or wrong. This old faith with its specific commandments was especially well suited to immature minds. In the childhood of the individual and of the race there is need of authority and obedience before it is possible to appeal to reason. Childhood is predominantly the age of obedience, adolescence of imitation and example, maturity of reason and judgment.

Society is compelled to repress many of the primordial reactions and instincts of the natural man. Our whole culture rests upon the suppression of antisocial impulses and the cultivation of social and moral reactions. If such reactions are to be built into character and become "second nature," they must be cultivated early, preferably in the home, and ethical teaching must be clear-cut and authoritative. The old ethics, when wisely inculcated, was admirably suited to this purpose. It did develop men and women of high moral character, and to a large extent it forms the

foundation of our present social systems.

Contrast with this older philosophy, theology, and ethics the newer revelations of science. The man of scientific mind seeks truth rather than comfort or satisfaction. He would follow evidence wherever it leads, confident that even unwelcome truth is better than cherished error, that the permanent welfare of the human race depends upon "the increase and diffusion of knowledge among men," and that truth alone can make us free. Science is not an esoteric cult and scientific methods are not mysterious or magical processes. Huxley once defined science as trained and organized common sense, and scientific methods of inquiry are only the careful and accurate methods that are used by intelligent people everywhere in the affairs of everyday life. *These methods consist in observation, comparison, analysis, and generalization.* Every sensible person uses these methods in his business or profession, and in his judgments of men, policies, and institutions. It is only in its greater accu-

racy that the scientific method differs from those in universal use. It is true that no scientific observation, comparison, analysis, or generalization is ever complete or perfect; it is true that in science, as well as in affairs of life, we deal with probabilities of a higher or lower order rather than with certainties; it is true that all generalizations are theories rather than facts and that all scientific knowledge is relative and not absolute. But in spite of these limitations, no other method of inquiry has been found as reliable as the scientific method.

It would seem incredible, were it not an actual fact, that anyone should object to the use of such methods of inquiry regarding the origin and nature of man, society, government, ethics, religion, the Bible, or anything else; but, alas! there are thousands, if not millions, of people in this country, some of them educated and intelligent with respect to things with which they have had experience, who refuse to apply common-sense methods of inquiry to such subjects, who characterize those who do this as

atheists, blasphemers, dishonest scoundrels, and who denounce science and scientists for laying impious hands on sacred things which must never be studied by the methods of common sense.

To those who refuse to apply scientific methods of inquiry to the study of man and society, cosmogony and theology, ethics and religion, but who base their whole conception of these upon ancient traditions or unreasoning emotions, science has no message; they neither understand the language nor appreciate the methods of science. But to the increasing number of those who recognize that man, society, and human institutions are proper subjects of scientific investigation, and who also realize that neither authority, tradition, nor prejudice is a safe guide in the search for truth, the question may arise as to what effect the scientific study of these subjects will have on human ideals, aspirations, and conducts. Accordingly, these remarks are addressed to those only who accept the methods and results of science in their application to man but who

are concerned that mankind shall grow not only wiser but also better as the ages pass.

The methods and results of science have shaken to their foundations the old cosmogony and philosophy. It is now universally recognized that the earth is not the center of the universe, but a mere dot in a mediocre solar system whirling through immeasurable space. Man is only one of some millions of species of living things on the earth, and although in mind and soul he is the paragon of animals, it is becoming increasingly certain that the traditional views regarding his supernatural creation and divine perfection are no longer tenable. On the contrary, the sciences of geology, biology, psychology, sociology, and anthropology are furnishing an ever-increasing amount of evidence that the body, mind, and society of man are products of evolution. The old philosophy of universal supernaturalism is giving place to a philosophy of universal naturalism; everything that has been scientifically analyzed is found to be natural

— that is, orderly, lawful, causal — and many men of science claim that “nature is everything that is.” Belief in an anthropomorphic God, a big man in the skies who made us little men in His own image, established society, ethics, and religion by His commands, and governs the world as a human autocrat, is rapidly yielding place to more idealistic conceptions.

It appears probable that the universe and man are subject to immutable natural laws; that causality is universal in the living as well as in the lifeless world; that the entire man, body, mind, and soul, develops from a germ and is the product of heredity and environment; that will itself is no exception to universal causality, since it is merely a link in the chain of cause and effect, being itself the effect of preceding causes and the cause of succeeding effects; that freedom is the result of intelligence acting as cause; that intelligence is the capacity of consciously profiting by experience; that instincts and emotions are causally related to body functions;

that society, ethics, and even religion are based primarily on instincts, emotions, reaction patterns, and ductless glands.

Some of these conclusions are tentative and may be modified by further research, but there can be no doubt as to the general trend of the scientific study of man and his activities. These conclusions, or others of a similar nature, are now accepted by most of the recent investigators in human biology, psychology, and sociology. The application of science and the scientific method of observation and experiment to human behavior has revealed much concerning the physiology of mind as well as the hidden springs of action, the unconscious complexes that determine our constitutional hopes and fears, our prevailing loves and hates, our delusions and failures, and “the sin which doth so easily beset us.” Recent studies indicate that there is also a physiology of ethics, and that our conceptions of right and wrong, of good and bad, are associated with particular body functions, reaction patterns, and instincts.

In short, man himself, in all of his manifold complexities and activities, is a part of Nature.

There can be no doubt that science has given us grander conceptions of the universe that were ever dreamed of in former times.

Even in its revelations concerning man, science is giving us not only truer but also grander views than the old ones. There is sublimity in the conception of man as the climax of vast ages of evolution, as the highest and best product of this eternal process, as the promise of something better still to be. The evolution of man from lower forms of life is not degrading but inspiring. Nature and human history love to proclaim the fact that a humble origin does not preclude a glorious destiny. "The real dignity of man consists not in his origin, but in what he is and in what he may become."

If all our activities are the results of natural causation, it means that the will is not absolutely free, but practical people have always known that freedom is relative and not absolute; that we are

partly free and partly bound. We know that we are able to inhibit many reactions, instincts, and forms of behavior and to choose between alternatives that are offered.

But however we may explain that which we call freedom, it is plain that for practical purposes it exists, though in varying degrees in different persons or in the same person at different times, and that it entails a corresponding degree of *responsibility*. The universality of natural law does not destroy ethics or the basis of ethics; on the contrary, it places morality upon a natural, causal, understandable basis. Furthermore, it leads to a more rational view of human behavior and to a more sympathetic attitude toward the criminal or the offender. As long as men regarded nonethical conduct as the result of absolutely free will, or of an evil spirit within man, it was logical enough to exercise the demon by torture and in general to "make the punishment fit the crime" rather than make it fit the criminal. But an understanding of the fact that nonethical conduct is

causal rather than capricious and is the result of natural rather than supernatural causation leads society to look for and to correct these causes rather than to seek vengeance or retribution. Indeed, the only justification for punishment of any kind is the correction of the offender or the protection of society; there is no longer any place in civilized society or in a rational theology for retributive or expiatory punishment.

A study of human history and prehistory shows that there has been a wonderful development of ethics and of religion. There is no satisfactory evidence that these were handed from heaven in perfect form, but there is abundant evidence that they, in common with all other things, have been evolving and that this process has not yet come to an end.

Whatever the ultimate basis of ethics may be, whether divine commands, intuitions and instincts, utility or pleasure, the content remains essentially the same: however much codes and practices may change, our ideals and

instincts remain much the same from age to age.

Nevertheless, the decline of faith in the supernatural origin of man and of ethics, the decreasing fear of hell or hope of heaven, and the increased freedom of thought and action brought about by science and education have led, in some instances, to a general weakening of the ethical code. When increasing freedom carries with it an increasing sense of responsibility and duty it never endangers progress, but when liberty degenerates into license it marks the beginning of social and moral decay. Freedom is one of the principal goals of human endeavor, but the best use man can make of his freedom is to place limitations upon it. We can be safely freed from external restraints only in so far as we replace these by internal inhibitions.

Partly as a result of this increased freedom from the old restraints, but largely as one of the terrible aftermaths of the World War, lawlessness, immorality, and selfishness seem to be more than usually evident throughout the world today. The war

gave social sanction to murder, arson, and theft; it unchained the wild beasts in men that long had been restrained; it glorified acts which in times of peace would have been abhorred; and it is no wonder that we are reaping the whirlwind. Grafters in high office and bandits in high-powered cars are preying on society. Lawlessness and selfishness are widespread.

The real problem that confronts us, and it is a great problem, is how to adjust religion to science, faith to knowledge, ideality to reality, for adjustment in the reverse direction will never happen. Facts cannot be eliminated by ideals and it is too late in the history of the world to attempt to refute the findings of science by sentimental objections or supposed theological difficulties. If science makes mistakes, science must furnish the cure; it can never be done by church councils,

state legislatures, nor even by popular vote.

The only possible remedy for the present deplorable condition is not less but more and better science and education; science that recognizes that the search for truth is not the whole of life, that both scientific reality and religious ideality are necessary to normal, happy, useful living. We must keep our feet on the ground of fact and science, but lift our heads into the atmosphere of ideals. "To the solid ground of Nature trusts the mind that builds for aye." Education from the earliest years must teach love rather than hate, human brotherhood rather than war, service rather than selfishness; it must develop good habits of body and mind; it must instill reverence, not only for truth but also for beauty and righteousness. — *Excerpt from the article of Edwin Grant Conklin in Scribner's Magazine, 1925.*