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ARTICLE I.

SCIENCE NOT SUPREME, BUT SUBORDINATE.

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CHRISTIAN theology has no controversy with science or with metaphysics. She accepts their teachings, approves their methods, and appropriates their results. A broad theology enriches and completes and buttresses itself with the spoils gathered by scientists and metaphysicians from the realms of matter and of mind.

Theology is not only on friendly terms with metaphysics and science, her life is correlated with theirs: her truths vanish like dreams, or turn into falsehoods, if their truths prove to be unreal. If the universe be only an illusion, its forms and forces but ideal shapes projected from the mind, as Fichte would persuade us; or if the universe be self-existent, unfolding in endless evolution from the simple to the complex, by the necessity of its being,—in either case, God, as Creator and Moral Governor, disappears, and religion becomes impossible. Or if man, as a personal, immortal, and responsible agent, drop out of the universe by absorption in some stupendous scheme of pantheistic development, as with Spinoza or Hegel; or by resolving mental and moral actions into functions of brain and nerve, with Bain and Maudsley; or by turning conscience into a process of association, with Mill; or a process of evolution, with Spencer,—in either case religion is impossible, and theology turns to a jugglery of words. Mr. Mill hopes, indeed, to bridge a more terrible chasm. He says, "We venture to think that a religion may exist without a belief in God; and that religion without a God may be, even to Christians, an

instructive and profitable object of contemplation." But a religion without God as the foundation of morals and worship, and without immortal beings conscious of responsibility, to govern, would be a phantom without a genesis or history, having a more shadowy existence than the "forms" of Plato, or the "species" of the Realist schoolmen, for which Mill cherished a profound contempt.

Theology requires, as its fundamental postulates, a personal God; a material universe, created by God but distinct from him; and man, with twofold nature, material, binding him to the universe, and spiritual, linking him to the Creator. Neither of these facts can be omitted from a true system of theology. The completeness of any system is conditioned by its exhaustive analysis of these facts and of their mutual relations.

Theology requires a careful study of the phenomena and laws of nature; for it sees in the phenomena the thoughts of God expressed in material forms, and in the laws the will of God acting by intelligible plan through living forces. "The works of the Lord are great, *sought out* of all them that have pleasure therein." Every devout mind welcomes the discoveries of science, as unfolding the attributes and purposes of the Deity. The wonders they disclose reveal divine wisdom and power; the beneficent arrangements with which the universe abounds give insight into the divine goodness. Nature, the elder revelation, "writ with God's own hand," makes known dimly, but truly, the divine character and will, and can never come into antagonism with the Bible. It is a part of the complete revelation, as the morning twilight opens the day.

But, while theology has no controversy with science, and its best expounders are students of nature who welcome eagerly every ray of new light thrown on its phenomena and laws, scientific leaders often provoke and compel controversy by assailing the doctrines of revela-

tion and the cherished convictions of Christians. A scientific hypothesis seems invested with a new charm, if it can be forced into antagonism with revealed religion. Professor Huxley frankly confesses the existence of such a tendency. He says, "One of the greatest merits in my eyes of the doctrine of evolution is the fact that it occupies a position of complete and irreconcilable opposition to that vigorous and consistent enemy of the highest intellectual, moral, and social life of mankind,—the Catholic Church." Mr. Darwin finds great delight in the assurance that his theory of progress by natural selection, "*whether true or not*, has overturned forever the dogma of special creations." These confessions indicate the spirit of many scientific leaders. Their eagerness to overthrow theology keeps pace with their eagerness to advance science. Assuming that theology is a mass of superstitious "rubbish," they count it an equal honor to expose error and to discover truth.

In our age the advocates of the physical sciences grow bold and arrogant. They claim recognition for their favorite studies as of prime importance, taking precedence in interest and value of all other branches of study. Science, they assert in words kindling into enthusiasm, is unerring in its facts and accurate in its methods, and exerts an influence practical and wholesome. Science supplants conjecture by knowledge, teaches truth in place of illusions, and enriches the mind with boundless stores. Its discoveries alleviate human woes; its inventions lighten toil and multiply comforts. Science is the greatest of benefactors: it should underlie our modern system of education, for the great aim of study is to acquire a mastery of nature. Enthusiasts venture to prophesy that science will introduce a golden age more to be desired than the Millennium of the Bible, and will found a new Atlantis more glorious than the New Jerusalem.

In this spirit Comte banishes theology and metaphysics

from the realm of knowledge. They belong to a past age, and must give way to positive science. In the same spirit Buckle excludes mental and spiritual influences from the forces which have created history and shaped human progress, and limits inquiry to the action of material forces, like food and soil and climate and the phenomena of nature. In this spirit, also, Professor Huxley endorses the dogma of Hume: "If we take in hand any volume of divinity or school of metaphysics, let us ask, 'Does it contain any abstract reasoning concerning quantity and number?' 'No.' 'Does it contain any experimental reasoning concerning matter of fact and existence?' 'No.' 'Commit it to the flames, for it can contain nothing but sophistry or illusion.'" Professor Huxley, like other masters of physical science, would direct human studies to the visible creation alone, and to the visible interests and destinies of men. All else he dismisses to what he calls "the realm of lunar politics."

It is proposed to discuss, in this paper, the claim of the physical sciences to outrank all other studies. An attempt will be made to prove that, in the field they occupy, in the methods they follow, and in the results they reach, they hold a subordinate rather than a supreme rank. They cannot hold a foremost place in the hierarchy of studies.

I. Their rank is subordinate in the field they occupy and the subjects they investigate.

The apothegm of Pope loses nothing of its force in this scientific age, "The proper study of mankind is man." Sir William Hamilton quotes from an ancient philosopher a more stately expression of the same idea, "On earth there is nothing great but man; in man there is nothing great but mind."

Science is not disparaged by such a statement. Its inherent worth and charm remain unchanged. Astronomy gauges the heavens, and discloses innumerable worlds in graded ranks of meteor and comet and satel-

lite and sun and nebula. It numbers and measures and weighs them. It groups them into systems, defines their relations, and adjusts their distances. It finds law ruling, far as the telescope can reach, to the outermost verge of creation; ruling so inflexibly that Leverrier can announce the existence of an unseen planet beyond Uranus, define its position, and find it on the first night of search. It analyzes the distances and motions of comet and planet and sun, and finds them conformed to the axioms and laws of mathematics; so that an astronomer cries, in adoring wonder, "God is the greatest of geometricians." We may concede to astronomy its rank as the grandest of the sciences. We may concede that it deserves and will reward a lifetime of study.

But who will deny that the human mind, which ranges over the universe at will, analyzing its constitution, reading its laws, measuring its forces, and solving the most intricate problems of its structure and movements, is a higher study than the material objects it investigates? Are not laws which govern the universe of higher value than the matter which they control? And do not laws, if they mean anything more than a succession of phenomena, and imply a causative power, belong to metaphysics rather than to physics? Above all, is not the divine mind, of which the human is a dim image, the grandest object of study? Is not the highest charm of astronomic study found, not in the masses of matter it discloses, or the physical relations it unfolds, but in the divine thoughts which seek expression in material forms and forces, and in the laws which give order to the universe? A divine mind underlies astronomy. "Natural selection" may possibly explain the advance of animal life along certain lines of progress, but it is impotent to adjust the orbits of the heavenly bodies by geometric law. It is equally impotent to explain how the mental toil of Grecian sages in working out the profoundest mathematical problems, which seemed at the time barren

of practical results,—a lofty type of intellectual gymnastics,—yielded abundant fruit to Newton and Kepler. These later students found that the earlier sages had builded better than they knew, and had thought God's thoughts after him; for the very theorems on which they had been busy in the study had been wrought out by God in minute detail in the laws of the solar and sidereal systems. Can any one doubt that the divine mind which organized the universe, and the human mind which penetrates its secrets, traces the hidden plan, and reads the thoughts written in planet and star, are loftier themes of study than the physics of astronomy?

The same principle applies to the newest and most fascinating of modern studies, the science of biology, coupled, as it is, with the grand discovery of the correlation of forces. Science uses the microscope with equal skill in tracing the processes of life, as the telescope in piercing the mysteries of the heavens. It has analyzed the structure of the human frame, learned the connection of its minuter parts, and discovered the functions of every organ. With a penetration that no complexity can baffle and a zeal that no failures can cool, it has explored the secret lines of movement between the outward world and the human. It finds in the spinal column of the body, as in animals generally, ganglia with reticulated nerves; the nervous fibres running outward to the muscles and inward to the brain. A message from the outer world runs along these fibres to the brain. A decision of the will runs from the brain through these fibres, and puts muscles of hand or foot or eye or mouth in motion. It finds, also, that as heat is a mode of motion in the material world, it accompanies mental action in the brain; and leaps to the conclusion that mental energy is a force correlated with light, electricity, and muscular action. Professor Huxley is confident that this correlation is absolute. He says, "All vital action may be said to be the result of the molecular forces of the protoplasm

which displays it: and, if so, it will be that, in the same sense and to the same extent, the thoughts to which I am now giving utterance and your thoughts regarding them are expressions of molecular changes in that matter of life which is the source of our other vital phenomena."

This opens a noble field of study,—the union of brain and nerve and muscle, and their correlation in originating and expressing human thought. The delicacy and completeness of the organization may well excite admiration. Scientific leaders, like Bain and Maudsley, may be pardoned for enthusiasm in magnifying the office of physiology, and in holding that the only way to psychology lies through its gates. We may excuse their blunder in mistaking organic functions for mental faculties, and the fine machinery through which the mind acts, for the living soul. But who does not see that if this blunder were a truth, it would strike a fatal blow at enthusiasm in study. If, as Huxley says, "in the physiology of the present, matter and law have devoured spirit and spontaneity," and "the physiology of the future will gradually extend the realm of law till it is co-extensive with knowledge, with feeling, and with action," then, by inevitable sequence, the higher value of physiological study will be lost. It is surely a loftier and more inspiring study, to trace the mind in its workings through the exquisite machinery which connects it with the outer world than to take the machinery to pieces and learn the order and uses of every part. It is a higher and grander study to discover in body and mind, in fine organism and marvellous adaptations, the wisdom and power of that Creator who hath done all things well. The scientist who mistakes the nervous fibres and the gray substance of the brain, the organs of the mind, for the living soul, commits a blunder as singular and fatal as that of the peasant who mistakes the galvanic cell or the wire for the electricity by which his message is sent. If he assign to natural selection the sole credit of organizing brain

and nerve to do their subtle work, it is as grave a blunder as for the peasant to suppose that metals and acids have come into the battery of their own motion, and the poles have lifted themselves from the earth by automatic force, and the wires have stretched themselves atrop by choice. An intelligent Creator is as needful for the facts of physiology as Professor Morse for the invention of the telegraph. The principle applies with equal force to chemistry or any other science. The divine mind that ordained their hidden mysteries, and the human mind that unfolds them, are loftier themes of study than the mysteries themselves.

Concede to the advocates of scientific study their largest claims; grant that it unlocks the universe to human vision; that it gathers stores of useful knowledge; that it is a great motive force in civilization, sweeping away errors and superstitions; in the last result, it can be awarded only a subordinate, not a supreme, rank.

Spirit is nobler than matter. A knowledge of man is more important than a knowledge of nature. The intuitional and reflective faculties outrank the perceptive. An analysis of the powers of the mind, and of its laws of action, is more valuable than an analysis of molecules in the protoplasm of a nettle, or in the protoplasm of the brain. The thoughts of the Creator expressed in matter are of higher worth than the shell which holds them; and laws which unfold the methods of God's working are of a loftier type than the matter or forces through which they act. These laws imply intelligence and power, and force demands for its origin an intelligent will. These laws enfold the universe. They rule alike in earth and air and sea, in inorganic and organic life, in the structure of living beings, their functions, and the conditions of their life.

Science, which limits its field by choice to the material and the visible, must hold an inferior rank to those studies which lay hold of the spiritual and the unseen.

It were unwise to depreciate the value of the material side of the universe, with its manifold beauties, its unity of spirit and variety of form. But it were more unwise to exalt it above the spiritual and divine side,—grander in nature, broader in range, more important in results.

II. Science is co-ordinate in the methods it follows.

Scientific leaders boast of the exactness of their methods and the certainty of their results. They walk on *terra firma*, not in cloud-land. They see by clear sunlight, not through twilight or fog. They assert with confidence that a sound mental philosophy can be reached only through physiology, and that religion is credible only when confirmed by scientific tests.

But it must never be forgotten that science is dependent on metaphysics and religion. It comes to birth only through mental philosophy, and attains a vigorous life only by a belief in causation and the veracity of consciousness, which have their root in God. Science comes to the birth, we say, through metaphysics. A knowledge of mind must precede, both in the order of nature and of time, a knowledge of matter. The mind must be self-conscious before it can recognize forms of matter apart from self. Professor Huxley mixes things strangely when he says, "What we call the material world is known to us only under the forms of the ideal world." This is an adoption of the transcendental philosophy by a disciple of the Positive School. It is a tacit denial of any certain knowledge of a material world; for if we know it only under ideal forms, the forms may possess no reality, and assume shape from the mind's own creative force. He is nearer the truth in another statement: "The reconciliation of physics and metaphysics lies in the acknowledgment of faults on both sides; in the confession by physics that all the phenomena of nature are, in their ultimate analysis, known to us only as facts of consciousness; in the admission by metaphysics that the facts of consciousness are, practically, interpretable only

by the methods and formulae of physics; and, finally, in the observance, by both metaphysical and physical thinkers, of Descartes' maxim,—'Assent to no proposition the matter of which is not so clear and distinct that it cannot be doubted.'

It is certain, as he admits, that the outward world is known to us only by the testimony of consciousness. The mind first knows itself in the process of thought. "*Cogito, ergo sum,*" is a primal truth without which knowledge is impossible. Professor Huxley's criticism is a frivolous one, that this formula consists of three parts: first, "something called 'I' exists"; second, "something called thought exists"; third, "the thought is the result of the action of the 'I';" and that only the second number, "something called thought exists," is beyond doubt. This statement is imperfect. Consciousness testifies not only to the thought, but to the thinking 'I.' It is not thought itself, nor thought in another mind, nor thoughts derived from books, which consciousness recognizes. The testimony is explicit and valid. It admits of no doubt, for the 'I' will be equally prominent in the doubt. It requires the 'I' to doubt no less than the 'I' to think.

The starting-point of knowledge, therefore, is found in consciousness, in the soul's witness to itself. After it has recognized itself, its knowledge may reach out to the world. It perceives matter directly, not, as Kant and Huxley teach, under ideal forms or as states of consciousness. It was Kant's theory, that the mind discerns not real objects but only ideal images of objects, that forced Hume by a rigorous logic into absolute scepticism. And it was the teaching of Reid and of the "common-sense" philosophers of Scotland, that the mind sees objects directly by presentation, not by image or representation, that restored the waning faith in the validity of consciousness and the reality of an external world. The mind *knows* things as it knows itself. It perceives relations between things that are known; and from a knowl-

edge of real things and real relations it can generalize laws.

Science, therefore, cannot be foremost or supreme; dealing only with matter, it cannot claim precedence of philosophy, which deals with mind. "Our knowledge of the soul is more immediate and more certain," as Descartes says, "than our knowledge of the body." The outer world can be known only by a mind already conscious of its own existence. Science begins its work with the facts of consciousness. It is carried forward by the mind, working according to its own laws. As Herbert Spencer says, "Science is an extension of perceptions, by means of reasoning." It deserves at best, therefore, only co-ordinate, not supreme, honor.

Nor can science claim precedence of religion. Faith in the testimony of consciousness must precede all certain knowledge. If one doubts it, he drifts over an open sea without anchorage. He may believe neither in matter nor mind, for both alike may be thought to be illusions. It is only when one rests in causation—a certain connection of effect with cause—and in the veracity of consciousness and of perceptions, both of which assurances are born of faith in God, that his belief in matter and in mind, in an immortal self and a material universe, rests on foundations which nothing can shake.

Nor can science claim any superiority of method over philosophy and religion. They follow the same law of formation and growth. Philosophy takes the facts of consciousness for its basis, the soul's testimony to its own life and working. It collects, analyzes, sifts, compares, and groups the facts, and, by a rigid induction, generalizes the laws which define the mental powers, and their sphere of action. It departs in no particular from the method of science. It has fallen into many errors, by mistaking the facts or misinterpreting their meaning. But the history of science records a similar succession of

errors in astronomy and geology and chemistry, and it cannot afford to throw the first stone.

Science can disparage philosophy only by discrediting itself. If it deny the validity of consciousness, it impeaches the veracity of the only witness for its own facts. If it deny any sure authority to philosophy, on the ground of past errors, it must equally condemn itself, for its own record is crowded with blunders in the most recent times. It is the duty of each, and surely of science no less than of philosophy, to re-examine fundamental facts, eliminate errors, and to accept no laws which fail to show a basis of sound induction.

Nor can science venture to discredit religion, for, in the act, she discredits herself by impeaching the veracity of her own witnesses, and denying the validity of her own methods. Religion, like science, rests upon the facts of consciousness. It discovers in the soul an instinct to worship. The instinct is universal, and implies a being to be worshipped, as perception implies an object to be perceived. Comte, after denying and deriding this religious instinct, found himself compelled to recognize and provide for it, and buttressed his atheistic philosophy by a worship of humanity and by a catalogue of saints as numerous as those canonized in the Catholic calendar.

Consciousness finds, also, in the human soul a disposition to believe as well as to examine, to trust as well as to know. No complete analysis of the soul's instincts can overlook this. It is often perverted in its workings, and leads to credulity or superstition or mysticism; but the instinct to know is equally perverted, and leads to rationalism and scepticism. Under wise guidance and restraint, the instinct to know leads to science; and the instinct to believe, to religion.

Religion, like science, extends the facts of consciousness by reasoning. It takes the facts furnished by intuition, as science takes those furnished by perception. With the

one, as with the other, consciousness is a competent witness. With the one, as with the other, sound reasoning must lead to truth. Christianity, no less than natural religion, follows the methods of science in establishing its authority. It announces a law and verifies its facts, or it collects the facts and infers the law. Its central truth is the divinity of Jesus Christ. This is its fundamental law, from which life and power go forth. The law is verified by the facts of his birth, his teachings, his miracles, his death and resurrection, and the power attending his disciples. Law and facts are in unison; they explain each other; they are essential to each other; they stand or fall together. If the law be valid, and Christ be divine, his life, with the series of miracles attending it, is as natural as the revolution of the earth by the unseen force of gravitation. If the record of his life be true, the law of his divinity is needed to explain his character and works. The scientific man may doubt the record of the facts, or may deny the sufficiency of the facts in number and weight to establish the law; but he cannot deny that Christianity follows the scientific method, announcing a law which attests its truth by sublime facts, and furnishing extraordinary facts which require the law to interpret them. If the miracles require the divinity of Christ to explain them, and the divinity of Christ requires the miracles to attest it, why is not the scientific order as complete as in the movement of the tides?

But Christianity justifies its claims by another use of the scientific method. It announces a law of spiritual life, growing out of a new birth of the soul by the Holy Spirit. A divine life is begotten in the soul, and manifests itself in action. It appeals to Christian experience to confirm the law. If the law be true, it will be verified by the lives of Christians. If a new order of facts has been visible in the world since the entrance of Christianity, a new law is required to interpret them. History

confirms the appeal. For eighteen centuries men and women, of many countries, of many nations, of various temperaments and social conditions and degrees of culture, testify to a similar experience. A sudden change has occurred in character and life. The controlling law of their being has been reversed: they love what they once hated; they hate what they once loved. The change has been visible to others, as when Saul of Tarsus became the apostle to the Gentiles, or the ease-loving Howard became the prison-reformer of Europe. Here are facts of inward experience and outward observation; facts numerous, varied, intelligible. They find a sufficient cause in the divine law. The law requires the facts: the facts require the law. Is not the scientific method complete? Are not the requirements of Professor Huxley fully met, by his own definition? "By science, I understand all knowledge which rests upon evidence and reasoning of like character to that which claims our assent to ordinary scientific propositions. And if any one is able to make good his assertion that his theology rests upon valid evidence and sound reasoning, then it appears to me that such theology will take its place as a part of science."

If multitudes of intelligent men whose scientific accuracy Professor Huxley would cheerfully endorse—men like Newton and Pascal and Faraday and the Herschels—have found the evidence valid and the reasoning sound which establish the divine mission of Jesus Christ and the divine life begotten by the Spirit, he cannot censure them if they cling to Christianity as tenaciously as to the laws of science.

If certain fundamental truths of religion are capable of scientific proof; if science is dependent on philosophy both for a knowledge of its facts and the exposition of its laws; our second position is established, that, even in its *methods*, science holds, at best, a co-ordinate, not a supreme, place. If, as Professor Huxley asserts, "philosophy

sophical questions underlie all physical science," philosophy may fairly claim precedence over science.

III. Science is not supreme, but subordinate, if we consider its results,—whether these relate to certainty of knowledge, or intellectual stimulus, or moral influence.

1. *Certainty of Knowledge.*

It is claimed, as a chief incentive to scientific study, that it leads to knowledge, definite and certain, unmixed with conjecture, untouched of doubt. Many a Mr. Gradgrind exults over the "solid specie" of scientific fact, in contrast with the paper currency of metaphysics and religion. Better an island of *terra firma* than a continent of fog-bank. The claim is attractive. The mind longs for certainty, for a solid foundation which nothing can shake. Does science give such certainty? The history of our times proves that even the masters of science, unless rooted in a sound philosophy or a religious faith, have no certain knowledge.

Comte began the gigantic labors of his life with a lofty purpose to find exact processes of thought, leading to absolute truth. He banished religion and metaphysics from the realm of knowledge, as unworthy of attention in the manhood of the race, and fit only for its infancy. "The credulity of the child," he says, "will give place to the solid knowledge of the man." He aspired to bring about a revolution in study and thought, and to build up a system of truth by scientific methods, complete and enduring. He claimed to have achieved success in this ambitious scheme. What is the verdict of our age on his stupendous work? Sir John Herschel says, "His system may be admirable in other particulars, but he evidently knew nothing about astronomy." Professor Huxley says: "He had but the most superficial, merely second-hand knowledge of most branches of what is usually understood by science. What struck me was his want of apprehension of the great features of science,

and his ludicrously erroneous notions about the part which some of the scientific doctrines current in his time were destined to play in the future. I did come to a nugget here and there in the chapters on speculative and practical sociology." John Stuart Mill is a master in social science, and he pronounces Comte to be "weak, wilful, and full of blunders in sociology," though strong elsewhere; and Herbert Spencer, who prides himself on his knowledge of method, says that "Comte's method" (which is the key to his whole system) "is contradicted both by reason and by the history of the sciences." Among these critics—all of them, but Herschel, disciples of Comte's school—the vain philosopher is plucked of every peacock feather, and the poor jackdaw is left naked and despised. The founder of the Positive philosophy, which was to secure certain knowledge, is proved by competent witnesses from his own disciples to be full of errors on all the subjects he treats and in the methods he follows.

But one may say, the failure of any leader, however eminent, ought not to discredit science. Let us turn to other representatives, and learn their processes. John Stuart Mill was a keen observer, a profound logician, and a careful thinker. Did he reach the goal of certainty? Far from it. He holds that the axioms of mathematics may be untrue in other worlds and to other beings; that elsewhere than on earth two and two may make five, and parallel lines may meet. He surrenders the possibility of certain knowledge, for all knowledge is illusion, if there be no ultimate truth.

Enthusiasts in physiological science, like Bain and Maudsley, can attain no certainty. They find no spiritual being capable of knowledge: mind has no existence apart from matter. Mind is only a finer kind of protoplasm. "Mental activity is a function of the cerebral substance." "Thought is a motion of matter," and "the formation of an idea is an organic process." On such a theory, knowl-

edge is no better than a dream: the epithet "certain" is a misnomer. Even the analysis of the brain and its functions is not accepted as certain by scientists. Professor Tyndall says: "I do not think the materialist is entitled to say that his molecular groupings and molecular motions explain every thing. In reality they explain nothing. The utmost he can affirm is the association of the two classes of phenomena, of whose real bond of union he is in absolute ignorance. The problem of the connection of soul and body is as insoluble in modern times as it was in the pre-scientific ages."

Professor Huxley is a foremost representative of the physical sciences and an enthusiastic advocate of scientific study. Has he found rest in certain knowledge? Alas! alas! he is driven to seek a kind of resigned contentment in Nescience, like Schopenhauer in Pessimism, and the Buddhist in Nirvana. He asks: "What do we know of matter and spirit, except as *names* for *unknown* and hypothetical causes or conditions of states of consciousness? In other words, matter and spirit are but names for the *imaginary* strata of groups of natural phenomena." And, he adds, "I take it to be demonstrable, that it is utterly impossible to prove that any thing whatever may not be the effect of a necessary and mechanical cause." Knowledge, therefore, may be only a kind of molecular action in the brain, like the motion of sap in a tree, and it is idle to talk of certainty, when there is no intelligent mind to know. He confesses his own remoteness from the goal of certainty in answering the question, "Does human nature possess any free volitional element, or is it only the cunningest of all nature's clocks?" "Some, *among whom I count myself*, think that the battle will forever remain a drawn one, and that, for all practical purposes, this result is as good as anthropomorphism winning the day." Here, then, is an apostle of science, holding a rank among his associates like Paul among the twelve, who admits that he is uncertain

whether matter or mind has a real existence, whether there is an organized universe to know, or a personal soul to know it, and forcing himself to believe that, for practical purposes, nescience is as good as religious faith.

Science, therefore, does not lead to certain knowledge. It can find no certainty, unless it borrow from religion a faith in God as Creator, who has indicated final causes in his works, or borrow from metaphysics a faith in the veracity of consciousness as a witness to the facts both of mind and matter. The hesitating mood of Professor Huxley is in strong contrast with the Christian assurance of Paul, "I know whom I have believed;" or of Lacordaire, who said, "I was unbelieving in the evening; on the morrow a Christian—certain with an invincible certainty." Our age is repeating the history of the first centuries of Christian life, when Christianity had a marvellous power in Rome and Athens, in Corinth and Antioch, because its disciples, though peasants and slaves, rested in a sure knowledge, when heathen philosophers were bewildered by doubts and walked in darkness.

2. *Science is Subordinate as a Stimulus and Guide to Intellectual Activity.*

It is a favorite theory with scientists that progress is born of doubt; that the shortest road to truth lies through the suspension of the beliefs of past ages; and that new discoveries of science, by their novelty and certainty and practical power, furnish the highest stimulus to thought and study.

The teachings of history give little support to such assertions. The masters of human thought, the leaders of the ages,—Homer and Plato; Bacon, Leibnitz, and Newton; Shakespeare, Dante, and Milton,—were pre-eminently men of faith: their greatness was born of faith, not of doubt: their writings pulsate with faith, and draw a vital force from the intensity of their beliefs. Sceptics have often done service to truth and quickened progress

by exposing errors and removing barriers and opening new fields of inquiry. But the service is chiefly negative and preparatory. They labor, and other men enter into their labors. It falls to the men of faith who follow, to reap the harvest.

The great epochs of history, fruitful in heroic men, in discoveries and inventions, in political progress and social reform; the epochs which are immortal for creations of literature and art, for the masterpieces of poetry and painting and sculpture and music, have been ages of strong faith. Let one turn from the pages of Shakespeare and Bacon, born of reverent faith, and aglow with the new life of the Reformation, to the pages of Farquhar and Congreve and Bolingbroke, in whose souls lofty ideals had faded out with the decay of faith; he will be conscious of a great change, even if he do not suspect the cause. He will feel like a traveller, descending from a lofty mountain where the grand outlook inspires the dullest souls, into a low valley chill and sombre, or to a monotonous marsh whose dreary stretches oppress the imagination and stifle pleasant thoughts.

Nor does history teach with less clearness that the highest intellectual stimulus has come from the side of philosophy and poetry, rather than of science. Homer and Plato, though the world has outgrown their knowledge, quicken thoughtful minds to-day with a profounder impulse than Aristotle and Newton, mightiest of the sons of men in the realm of science. Science was never so aspiring as in the present age; never was its range so wide, nor its spirit so bold, nor its discoveries so wonderful. But Goethe and Tennyson and Ruskin have stirred the hearts of living men more profoundly, and have touched the springs of life with a stronger magnetism, than Faraday or Tyndall or Huxley.

The facts are evident, and the explanation is simple. Man can be lifted to a higher plane of thought and life only by a power above himself. He can be moved might-

ily only by forces from without that attract and inspire the best elements in his nature. The great truths of religion—the being and moral government of God, the incarnation of Christ, and regeneration by the Spirit, immortality and judgment—hold latent forces that can sway the soul and move its currents of thought and feeling as the moon lifts up the sea. Sceptics may ridicule, but can never deny, the inspiring power of religion on human souls.

So minds, gifted with insight into the mysteries of matter and spirit, who can read the hidden truths of reason and conscience, and interpret to men their most secret dreams and yearnings; minds, whose insight pierces the universe, discovering the thoughts of God, recorded in material forms, in natural law, and in the forces which move the world; and unfolding the divine plan, revealed in types of structure, and organic functions, and the harmonies between the conditions of life and the forms of life,—such minds, the great seers of the race, draw human hearts to them as surely as the magnet draws the needle. Philosophers or poets or literary men, gifted with such insight, become fountains of life for their own generation and for all ages.

Just so far as science can discover the invisible in the visible, can read spiritual thought in material forms, and intelligent purpose in organic structure, and can trace the divine plan in the complex machinery of the universe, guiding its movements to moral ends, just so far will science attain power over men like philosophy and poetry. But just so far as she disclaims all interest in the subtle connections of the seen with the unseen, and limits her inquiries to the visible and the material and the mechanical, will her magic power over the soul be broken, and enthusiasm in her researches will wane.

Let the dreams of scientific men become realities; let the soul disappear under the scalpel and the microscope; let thought be defined as molecular action, like the secre-

tion of the liver; let spirit and spontaneity be swallowed up by matter and law, so that man, in Huxley's words, is only "the cunningest of nature's clocks": how can enthusiasm in study survive, when nothing is left worthy of study? Science would lose its charm for earnest men. Tennyson speaks for the multitude in his indignant strain,

"We are not cunning casts in clay.
Let science prove we are, and then
What matters science unto men,
At least to me — I will not stay,
For I was born to better things."

Let God drop out of the universe, as non-existent or unknowable; let traces of a definite plan disappear, and proofs of intelligent purpose in agencies organized for specific ends; let necessity, with inflexible law, banish thoughts of a loving Creator; let blind forces, or an impersonal power, called natural selection, direct progress: what remains to give worth to life, or to inspire enthusiasm in study? Ichabod might be written on the heavens and the earth, for the glory would have gone from human interests. Science ceases to have inherent worth when her facts and laws cease to be the expressions of an intelligent mind. She is guilty of wilful suicide when, by leaving out the Author of life from her inquiries, she busies herself only with the dead forces of a dead universe.

Would books retain their interest for readers, if word and paragraph were arranged by mechanism and gave no sign of the wrestlings of a living soul? Would paintings have any charm for the lovers of art, if a brush moved by steam put forms and colors on the canvas and behind the brush were no creative mind? Nay, would artisans even care to examine a machine, if its various parts were not devised by an inventor to work out definite results? In all soberness one may ask, How can science retain an interest for thoughtful men, if the universe cease to be regarded as the creation of an intelli-

gent mind, if one can read no divine thoughts in its laws, and discern no proofs of a divine artist in its harmonies of color, and find no plan of a divine builder in its innumerable adaptations?

Science, as the handmaid of religion and philosophy, will ever be a wise and beneficent teacher. As an interpreter of God's works and plans, she cannot fail to inspire enthusiasm and reward toil. If she be content to hold a subordinate place, and pursue her work under the guidance of faith, borrowed from religion, and of final cause, borrowed from metaphysics, her sphere will widen with every new discovery, and her methods and results will fascinate the loftiest minds. But, if she spurn allegiance and aspire to supremacy, she gathers about herself a darkness denser and drearier than the darkness of Byron's "Dream," and throws over her disciples a benumbing spell, like the enchantment in the story of the Arabian Nights, which turned a city of the living into a tomb of the dead.

In God's light we see light. Nature, when she reflects the presence of a living God, glows with beauty, and incites thoughtful minds to enthusiastic study. An eloquent French preacher utters the experience of a host of scientific students when he says: "Once a Christian, the world did not vanish from my eyes; it grew larger, as I myself did."

3. *Science holds a Subordinate Place, in respect of Moral Influence.*

Arguments, numerous and plausible, are urged in our popular journals for an enlargement of scientific studies. The system of modern education is arraigned for its impractical nature, and its remoteness from the work of life. A radical reform is urged in the High School and the College, by which the various branches of physical science, so closely connected with modern life, may supplant the classics, "those *dead* languages," and supplant also

mental philosophy, "those old-fashioned mental gymnastics," barren of profit. "We live in a practical age," is the popular cry, "and the young need a practical education to fit them for the work of life." Science provides for the needs of the hour; let it take the foremost place in study.

But what is a scientific education? Professor Huxley defines it as "the instruction of the intellect in the laws of nature; under which name I include not merely things and forces, but men and their ways, and the fashioning of the will and of the affections into an earnest and loving desire to move in harmony with those laws." This is a broader view than is commonly taken by those who clamor for a practical training. Their aim is to sharpen the intellect, to stir ambition, and train to energetic business habits.

But is not that education the best for all purposes which forms the loftiest type of character and the largest manhood? Is not that man fitted for the best success in practical life whose intellect is strengthened by severe culture, and his aims ennobled by broad views, and his will disciplined by self-denial? It will not do for educators to forget that life is many-sided. There are harder battles to be fought than against penury, battles against appetite and selfishness and avarice and lust. There are higher victories to be won than success in trade: purity of heart, abhorrence of vice, firmness in the right, emulation of the good. It is a grave question, Has science a high practical power in training for such a life?

Religion has proved to be an efficient helper. The Bible is a great force in education. The attention it demands, the close study it exacts, the habits of discrimination it cultivates, the precepts it enjoins, the spirit it breathes, give to the Bible an educational power for the practical work of life that no other book can rival.

The inspiring power of the classics has been tested through many ages. They treat of heroic times, of lofty

deeds, of men adorning states by high character and cheerful sacrifice. Emulation kindles in the presence of great souls. The classics make their readers familiar with the masterpieces of genius, whose power in quickening thought, and refining the taste, and purifying character has been proved by the experience of centuries. Augustine, the greatest of the Christian Fathers, was won to virtue by the eloquence of Cicero and recovered from scepticism by the divine thoughts of Plato; and statesman and poets and scholars, the leaders of the race, have borne similar witness to the power of the great authors of Greece and Rome. Is not this the best kind of training for practical work?

Nor can the services of philosophy be overlooked in the formation of character. It has taught men to set a higher value on spiritual than on bodily health, to be more eager to lead a noble life than to attain material success. It has led to God, to truth, to duty, to pure living. It has strengthened the mind by teaching it to wrestle with great themes: it has ennobled character by inspiring a love of the good and the beautiful.

Will science put forth a similar power in moulding character and elevating the life? It deals with the visible and the tangible, and banishes from the realm of inquiry the spiritual and the eternal. The science of our time (we speak of acknowledged leaders, who are most eager in pressing its claims to attention) doubts the existence of the soul, and denies a divine creation of the body. It develops man from the ape; defines thought as a function of cerebral substance, a synonym for molecular changes in the brain; resolves conscience into a series of associations, and free choice into necessary law; and remands God—if there be a God—into the region of the unknowable, where reason cannot find him, nor the affections reach him, nor souls in urgent need of help appeal for succor. Can studies of such limited scope inspire lofty aims and nurture strong character? Can they,

taught in this way, prepare effectively for the hard work of life? Can moral strength endure, if unfed by faith in God, in immortality, and in eternal right? Is not the issue inevitable that multitudes, receiving only a practical education, which has no vital union with religion or morals, will fail in the moral stamina needed to resist great temptations; and will go down like grain before the sickle, when the forces of evil in our age of luxurious tastes press them with lures of immediate and great gain? During the last thirty years education in Paris has been chiefly scientific. Religion and philosophy have fallen under the ban of the leaders in social life. Has the result been satisfactory? Do the signs in the political horizon foretell the near approach of a golden age? Let the dearth of great men in the army and state, in the recent struggle with Germany, answer. Let the excesses of the Commune, plundering and burning with fiendish glee the grandest buildings of Paris, give emphasis to the reply. Science must fail disastrously in supplying moral strength for the work of life, unless it be preceded and followed by other studies which bring conscience and duty and God into the foreground.

We have reached the goal proposed in our inquiry, and have aimed to cherish a spirit of candor and fairness in the entire discussion. The conclusion reached may be adverse to the spirit of the age, but will receive new confirmation, we believe, from experiments now in progress. Wise educators will recognize that science deserves not the supreme, but only a subordinate, rank in the scale of modern studies, whether it be judged by the nature of the field it occupies, or the methods it follows, or the results it attains.

Theologians have no reason to disparage the worth of scientific study, to fear its discoveries, or be jealous of its growing power. They can afford to welcome all its additions to human knowledge, for every discovery will enrich theology and give testimony, however reluctant,

to the wisdom and goodness of God. But the interests of science, its healthy growth and permanent influence, demand that it be held in its true relations, and be made subordinate to the higher studies which deal with God and spirit and an eternal life.