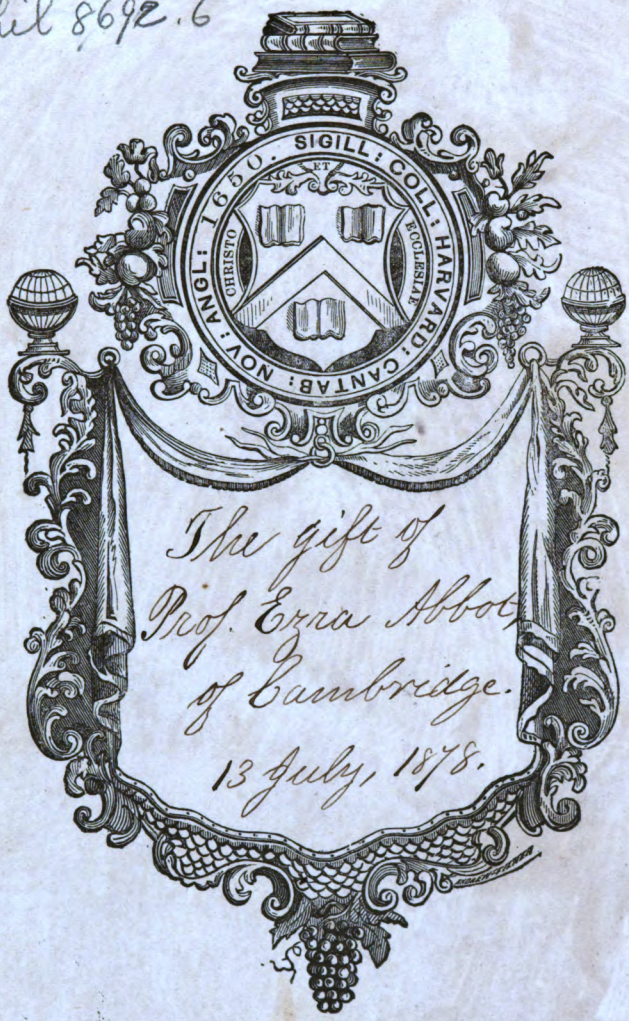


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13 July, 1878.



THE BIBLE ON THE SIDE OF SCIENCE.

A LECTURE *Crosby*

DELIVERED IN NEW YORK, DECEMBER 14, 1874, BEFORE THE
SOCIETY FOR THE ADVANCEMENT OF SCIENCE AND ART.

BY

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THE BIBLE ON THE SIDE OF SCIENCE.

“THE conflict between Religion and Science” and “the conflict between the Bible and Science” are not equivalent expressions. Religions are manifold, the Bible is one; Religions are largely subjective, the Bible in its letter is objective. In its contest with Religion, as Religion has been represented by courts and councils, Science has often gained a decided victory, for she has been the advocate of truth, while Religion was the advocate of error. Such a contest has frequently taken place, and in these the world was indebted to Science for deliverance from the bondage of superstition and ignorance. But between *the Bible* and Science we deny that a conflict ever existed. It is common to use this phraseology of antagonism, but it is from a confusion of ideas to which I have alluded. That which has been supposed to be a conflict between the Bible and Science, when reduced to its lowest terms, is simply an attack by a few scientific men upon the Bible. These scientific men assault the Holy Scriptures, but the Scriptures make no counter-attack on Science. The Bible is on the side of Science. It is my purpose this evening to show, in a very brief and imperfect way I know, that the Bible is a scientific book, and that therefore if any scientific men attack the Bible, it must be from other motives than the love of Science. What those motives are, perhaps the Bible itself might tell.

1. The first fact to which I would call your attention is this, that *the men who have held the Bible as their guide, and who have revered it as the Word of God, have been the founders and fosterers of modern science.* The nineteenth century is marked by brilliant discoveries in all departments of scientific investigation. The heavens have been entered by the bold yet reverential tread of Science, and the very glory of the sun analyzed by the spectrum. The material constitution of the planets, the composition of comets, the orbital character of what the common language was wont to call "shooting stars," the magnetic quality of the aurora, the cyclic course of the winds and the law of progression for their circles, the formation and dispersion of clouds, and the causes and conditions of electric phenomena have all been, with more or less perfectness, explained and charted out by the ingenious and devoted energy of earnest searchers after the great truths which lie about us in the realm of Nature. The earth, too, has been pierced for its secrets, and its foundations successfully examined for the history of its marvellous construction. The story of ancient races of plants and animals, man perhaps included, has been told us by the uncovered rocks, and the mind refuses to compute the long, long ages in which the work of earth-building was in process. The sea has been sounded and its varied floor made visible to the scientific eye, its currents, upper and lower, found to form one harmonious system, and its inhabitants studied and catalogued as if they were the familiar inmates of a barn-yard. Heat, light, and electricity have been tested until their laws, if not their essence, have been understood, and through this knowledge they have been made to minister to man in ways that would have been incredible to our fathers. As discoveries multi-

ply, much more do inventions multiply, for every new principle may have a thousand applications, and so the means of settling and civilizing the whole earth have given our age an energy and growth utterly without a parallel in the history of mankind. Who, before these facts, can belittle Science, or deny her claims to our profound respect and sincere gratitude? Who can doubt that in the advancement of Science we are obeying the command given by our Maker to the race at the beginning, "Replenish the earth and *subdue it.*" Is not a knowledge of the elements of which the material world is composed, and of their laws, a necessary preliminary to that *subduing* of the whole to which we, as made in the image of God, are commanded? This is the very place of Science, and to oppose her is to rebel against God himself.

But whence have proceeded these grand discoveries and inventions of the present age? Have they sprung suddenly from no antecedent? Or, like other human attainments, have they a history of inception and growth? Have they roots in the past, germs which have been nursed into their present fruitage? It will require no very extended research to see that the scientific activity of the modern age has proceeded from the schools that throughout Europe and America stud the land as the bright stars stud the sky. The great investigators have either been college-bred men, or they have used the appliances of colleges and universities for their successful work. From the colleges they received the taste for exploration, the incentive to it, and the knowledge how to conduct it. These foster-mothers have been proud of their children and made their fame their own property. And whence came the colleges and universities? Who founded Prague and Vienna and Heidelberg and Leipsig and

Tübingen and Jena and Halle and Göttingen and Berlin and Bonn? Who founded Salamanca and Oviedo and Valladolid and Oxford and Cambridge and St. Andrews and Aberdeen? I could add scores more of distinguished names in all the countries of Europe, names that are very dear to science, where her streams have been conserved and widened and deepened as the centuries went on. Who, I say, founded these great centres of learning into which whatever of knowledge Greece and Arabia had gathered, flowed as into appropriate homes? *The men of the Bible founded them.* They were pressed to such grand works just by the impulse of that grand old Book of God. When all the rest of mankind were caring either for the mere necessities of physical living or for wars of aggrandizement, Bible men were holding up the torch of science and striving by its light to read and understand the wonderful works of God. In the monasteries even (amid many dark and superstitious souls, it is true) were found the Roger Bacons, who were the precursors of the Newtons and Boerhaaves and Lavoisiers of later ages. It is vain to say they were persecuted. That makes only against their age, not against themselves or the Bible impetus under which they acted. The universities were always on the side of liberal study, and opposed to the restraints of superstition; and to them, under God, Science is indebted for the high ground on which she stands to-day. If the Bible were opposed to Science, think you that these things could be?

But, again, let me ask, who founded the colleges of America? Who set up these hundreds of schools, where the sciences are carefully taught? Who provided, by endowments and legacies, for continual instruction in every branch of scientific research? Again

I answer, *Bible men*. With a very few exceptions, Bible men did it all—men who honored the Bible as the source of all wisdom, and who, by imbibing its spirit, provided for their fellow-men.

Now I ask every candid man if it is at all likely that the Bible can be the enemy of Science, or even apathetic with regard to Science, and such results as these appear? Are not the few scientific men who are now attacking the Bible acting an ungracious and ungrateful part?

2. But I now turn to another fact. It is this, that *the very first scientific minds, marked in the annals of science for their discoveries, have been Bible men*. Sound, more than merit, attracts attention. One would think by the blast that is being made in the world just now that all scientific men must necessarily be arrayed against the Bible. The young and inexperienced are overcome by the clamour, not having yet learned that an empty barrel makes more noise than a full one. And so it becomes necessary for sober-minded men to call attention to some facts that are awkwardly in the way of the misleaders.

Newton was only one of hundreds in his day who, given to Science, loved and revered the Bible. From Newton's day to this the succession has been complete, not in an attenuated line, but in a broad stream of faithful Bible men, and the Science that in our time boasts of its Faraday, its Forbes, its Carpenter, its Hitchcock, its Dana, and its Torrey, certainly cannot be considered as occupying a hostile position toward the Bible. If the Bible is opposed to Science, how strange that these acute men, who know (or knew) the Bible well from constant study, should never perceive it, while it was left to others, who do not know it at all, to make the important discovery!

Is there not more boldness than Science in such a proceeding?

To enlarge on this point would be simply to quote the names of men distinguished in every department of scientific study, who have been no occasional exceptions, showing some personal eccentricity, which could account for the reverence for the Bible, but were in the ordinary use of their natural reason, and never suspected by their fellows of any inconsistency in upholding with equal hands the claims of Science and the truth of the Holy Scriptures. They were men who had felt the power of the Scriptures in the inner life of the heart, had received the impress of their truth in a region where faith is assurance, had seen the God of Truth in the glory of his oracles, and were ready to say with the late President of Amherst College, himself a scientific man of no mean rank, "If the supposed results of scientific discovery should be found to be antagonistic to the Bible, I should cleave to the Bible and suspect the results." This deep, inward, experimental knowledge hindered not their course of exploration in the realm of external Nature, but rather gave it a divine sanction and zeal. To such men the *à priori* argument (which to others would, of course, be of no value) would have full weight, that the God of Truth could not err in his teachings regarding Nature, while conveying to man the more important teachings concerning grace. If God declared a way of salvation and a cosmogony, the cosmogony would be as true as the way of salvation, however the two might differ in their relative importance to the individual man and his destiny. If there is an error in the cosmogony, the way of salvation may be rightfully discredited, whether wilfulness or ignorance be the cause of the error. A *man* might be imagined as making a mis-

take in his physics and yet being true in his moral philosophy, but a *God* never. If he err anywhere, he is no God.

I say this course of argument is of weight with those who have proved the Bible by its divine heart-touch. Others would deny that God had anything to do with the cosmogony of the Bible; but the Bible heart takes the Bible testimony concerning Moses and all who wrote the books of the Old Testament, that holy men of God spake as they were moved by the Holy Ghost. The Bible, that they revere and love, has this endorsement by God himself, *πᾶσα γραφή θεόπνευστος* (*all Scripture is God-inspired*), and they have no eclecticism to use with regard to its entirety. Where no didactic statement is made, they can expect to see phenomenal language used by God and by his inspired prophets, the language which all understand, the language which scientific men themselves use in their ordinary speech, in using which no one for a moment suspects the user of ignorance or founds an argument thereon against his scientific character. But when the inspired writer teaches a cosmogony or asserts an historical fact, involving scientific elements, where the phenomenal language would be falsehood, the Bible men of science accept the statement as the truth of God. Even in these, phenomenal language may be used for the filling up (as in a scientific treatise prepared for the popular understanding), but the main framework of the teaching must be strictly exact. No man would accuse a Leverrier of scientific ignorance who should use in his almanac (provided he published one) the phrases "the sun rises" and "the sun sets," or who should say, "when the sun reaches its most northerly point," although, scientifically viewed, these expressions are absurd. Just as childish is it to accuse

the Bible of scientific ignorance, because it states that the sun and the moon stood still, or, in its ordinary dialogue, poetry or history uses the popular and unscientific language of the day.

3. A third fact in my proof that the Bible is a scientific book is *its express allusion, by bold statement, to facts of science which have only lately become known to scientific men.* A careful examination of the Holy Scriptures will convince any candid searcher that the God of Nature is speaking in the words of grace, that He who made each atom of matter and each joint in causation is the direct inspirer of a phraseology that had no support in the general knowledge of the day, nor in the special knowledge of philosophers, but that has been confirmed by the discoveries made thousands of years afterwards by the investigators of Nature and her laws. Let me enumerate a few instances.

In the book of Ecclesiastes we have the return of water by evaporation from the sea to the springs expressly stated. "All the rivers run into the sea, yet the sea is not full; *unto the place from whence the rivers come, thither they return again.*" No human being in that age was qualified to tell the writer of Ecclesiastes that scientific fact. How did the writer hit on such a record? Was it a happy accident? or did the God of Nature guide his thoughts and pen?

In the 139th Psalm we read, "My substance was not hid from thee, when I was made in secret, and curiously wrought in the lowest parts of the earth" (*b'tachtiyyoth aretz—in the under parts of the earth*). What man in David's day would have dared trace the elements of our bodies beyond the parental source? Who then on earth had so studied the chemistry of life as to find in the upturned strata of the earth, the rocks and coals upheaved from their original bed, the

molecular fountains of the human body. It was for science but lately to show to the world how all the elements of Nature flow in and out of organisms, and so how every atom now existing in my body may once have been in plants and earths and rocks and sea, and from these have been carried into the stream of organization. And yet here in this grand old psalm of David, written three thousand years ago, this great truth of science is expressly uttered, and the parts of our bodies shown, when they were in the soil and its contents, before they took their position in human generation, and when God in inorganic nature was guiding them all through their intricate paths to their destination.

In the Second Epistle of Peter we have the uprising of continents from below the surface of the sea told us in the clearest words, a great truth which is supposed by many to have appeared but now among men, and that as the result of scientific researches. When we hear modern science glowingly describe the old liquid *aequor*, and then the Andes rising gradually above it, and then the Alps and Himalaya in their proper order, we are charmed with the picture and are ready to crown with laurels the earnest men who have wrought out this primeval history by patient investigation and comparison. And this is well; all honor to these faithful and successful students of God's grand universe, who have used their observation and logic, as God intended them to be used, for the enlargement of knowledge, the advancement of mankind, and the glory of the Maker. But while we gratefully place these laurels on their heads, let us not forget to go back eighteen centuries and hear a fisherman of Galilee, taught by the God who made the earth, use this language, not understood when he uttered it, perhaps even by him-

self, but now made clear by the labors of Science: "By the word of God the heavens were of old, and the earth standing out of the water and through the water" (*γῆ ἐξ ὕδατος καὶ δι' ὕδατος συνεστῶσα*)—literally, "the earth out of the water and through the water in the process of getting its consistency."

Because the phrase "foundations of the earth" is frequently used in the Scriptures, it is loosely charged upon the Bible that it recognizes the old fanciful idea of a stable, immovable earth, solidly founded on indefinitely deep foundations, in direct antagonism to the fact of its being upheld in space. But this charge utterly fails when we see that the Bible expressly declares of the Maker of all, "He hangeth the earth upon nothing" (Job xxvi. 7), which is the exact translation of the Hebrew "Toléh erez 'al b'limáh," so that the Bible phraseology of the earth's foundations is just what would be used in any poetry, though the poet were the most scientific astronomer. In this statement of Job we have another of the numerous evidences of a scientific knowledge finding utterance in the Holy Word, which was so far beyond the knowledge of the day that it could only come from Him who was the author of nature.

It has been beautifully shown us by the late discoveries of science that there are asteroidal bodies innumerable pursuing their orbits around our sun, through whose path the earth at times passes, when some of these bodies come within the influence of the earth's attraction and are broken by contact with the earth's atmosphere and are thus precipitated to the earth's surface in stones of larger or smaller size. They are really stars visiting our earth. But did you ever think that the Bible recorded this fact more than thirty centuries ago? When Deborah, the prophetess of God,

sang her magnificent pæan of victory over the vast hosts of Jabin and his general Sisera, she singles out one feature of the Divine interference in routing the foe, akin to that which sent the hailstones upon the flying army of southern Canaan in Joshua's day. She sings, in her gratitude to God, "The stars in their courses fought against Sisera." Why attribute to a silly astrological superstition what is perfectly explicable on scientific grounds? God made the aerolites to serve his own purpose, and he who directs all the conjunctions of nature used the asteroidal phenomena, to which we have referred, in his guardianship of his own people.

It has been common to say that Scripture makes a mistake in speaking of the ant as storing up its food, that in reality it only stores up its eggs; but Colonel Sykes discovered at Poonah a species of ants (*Atta Providens*) which regularly stores up the seeds of millet for its food in stormy weather. The objectors did not know enough when they corrected the science of Scripture. They have been equally premature when they have objected to the Scripture statement regarding the ostrich abandoning its eggs, for late researches have proved that the ostrich quits her eggs during the day, and abandons them altogether if there has been any intrusion upon them, thus furnishing an admirable type of carelessness regarding offspring.

These instances of the scientific accuracy of the Bible might be indefinitely multiplied, but I shall content myself in the narrow limits of a lecture to the mention of but one further example.

It is a favorite theory with many that the egg was before the animal, and the seed before the plant; but this is not a truly scientific view of the matter. We plant an acorn, and, it is true, there grows up from this

seed the branching oak with its mighty limbs and rich foliage. But whence came those limbs and that foliage. From the seed? Certainly not. The oak was never in the acorn. There was a vital principle in the acorn, by whose action under certain requisite conditions the materials from surrounding nature were drawn to it, united, and assimilated so as to make the oak. The oak, we know, was never in the acorn. Could that great bulk have been in the little seed? When that acorn was planted, the future oak was lying all around in the other vegetable matter of the earth. Now then, if the analogy of growth, as we see it, requires not only the seed, but a surrounding field of material for that seed to use, how could an original seed have effected anything when there was no surrounding vegetation? The oak must have been before the seed, the animal before the egg. If we are going back to originals, it is in this way we must solve the problem. And now what does the first chapter of Genesis say? "And the earth brought forth the herb yielding seed (not the seed yielding herb), and the tree whose seed is in itself (not the seed whose tree is in itself)." What mere human mind would ever have thought of putting it in this way? And yet this is the only way in which a true science can settle the question between the seed and the tree.

4. And this brings me to my fourth fact regarding the scientific character of the Bible, that *it supplies the links in the scientific chain which our experimental science would ever fail to reach.* The analysis of matter, to a very wonderful degree of minuteness, through the use of the microscope, spectrum, and chemical appliance, and also the connection of some of the lower phenomena of causation, through which old arts are enriched and new arts created, form the wide and yet

limited field of human research and discovery. Experimental science always finds itself at last on the border of the great unknown. Conjecture may go further, but science has nothing to do with conjecture. Our atomic theories, and evolution theories, that have thrown up such a dust of late, have all their standing in the realm of conjecture, *where true science never presumes to tread*. They are as utterly foreign to science as the South Sea Bubble was to legitimate business. It is one of the strange facts of the day that theories which are as phantom-like as those of the Vortices or Simms' Hole, have stalked through our civilized world these few years past, gaining credence and homage among the crowd, because of the robes of science which some clever wags have adroitly thrown around their shoulders. The people have a profound and righteous regard for Science, and are very ready to receive all that bears her honored endorsement, and to such an extent are they loyal, that when some old and decrepit theories, that have not a grain of science in them, but belong to another department of thought altogether, come with the name of Science daubed upon their brows, the unsuspecting public yield them an honest reverence. Experimental science, as I said, always finds itself at last on the border of the great unknown. Whatever is to be known beyond this border cannot be derived from human experiment, for the workings are in a sphere where no human sense has play. And conjecture is only a slight veil for disappointment, and brings no satisfaction to the mind. What then? Are we to know nothing beyond? Is experimental science the all of science? Has she no other expounders than human observation? Can no one tell us what we cannot tell ourselves? Is there no friend in all this vast universe to help us out of our ignorance? Why can-

not some higher intelligence whisper into our ears the secrets that lie beyond our own sense-perception? There must be something above us. Why does it not give us light? Now, in answer to such natural queries and querimonies stands the Bible, the Book of God. For thousands of years it has been the bright lamp to the feet of millions of our race. It has carried in its rays the testimony of its divine character, enlightening the eyes, converting the soul, renewing the life. No such strong evidence for any fact cognizable to man can be gathered as the evidence for the divine authorship of the Bible. All modern civilization rests on the Bible. All the discoveries and appliances of art and philanthropy for the elevation and well-being of mankind, which make modern civilization so contrasted with the pseudo-civilization of Assyria, Babylon, and Egypt, sprang from the Bible. Wherever the Bible goes, there are established law and order, the rights of men, and the influences of human sympathy. And when it comes to the individual heart, there spring up personal peace and joy, a holy satisfaction before God, and desires after purity and truth. Myriads of witnesses point to the Bible and say, "Thence came our new life." Now this overwhelming testimony cannot be brushed away by a contemptuous sweep of the arm. A scientific mind must regard *all* facts and admit *all* honest testimony. And it is this Bible, thus evidenced from without and from within, that completes our science by revealing from a higher intelligence those upper links in the chain of causation that human experiment never could reach. It controverts nothing that we have discovered, but it complements our discoveries with a divine revelation. It shows the beginning of causation in the Divine purposes of grace, and allows no breach between the Creator and his creation. By

such splendid imagery as we now quote, it conveys to our minds the grand truth of God's superintendence of all the movements of this commingled nature: "He holdeth the winds in his fists; he ruleth the raging of the sea; he rideth upon the heavens; he flieth upon the wings of the storm; he measureth the waters in the hollow of his hand, and meteth out heaven with a span, and comprehendeth the dust of the earth in a measure, and weigheth the mountains in scales; he drieth up the sea, and maketh the rivers a wilderness." In this way the Scriptures refer all the changes which our experimental science correctly classifies, and whose proximate conditions it carefully notes, to the ever-watchful providence and intelligent guidance of the Supreme Maker of all. The grandest movements of nature and the smallest events in its history are alike decided by his presence and power. He establishes the stars in their paths, and not a sparrow falls to the ground without Him.

Besides this governing and guiding presence, the Bible reveals another link in the chain of material causation. It shows back of the power the Divine heart of grace. It declares that *all things* work together for good to them that love God. It thus puts a soul and an emotion in all this varied interlacing of material phenomena, God the Almighty Creator and his infinite love. Nature is no more a fragment. It is complete. It is no more a blind fatality, but a designed adaptation in its every joint. It is no more a cold corpse, but all alive with the pulsations of the heart of God.

And is not this revealed truth concerning nature far more important to us than all else which our experimental science can elicit? Does it not furnish rest both for mind and heart where experimental science

would utterly fail? Does it not satisfy the cravings of our souls, which cravings were made to expect this very revelation from our God? And is not our real triumph over nature gained when we can look around on all its grandest and most awful features, and say in calmness, "My Father made them all—his hand upholds and guides them all"?

Such, then, is my fourth and last fact regarding the scientific character of the Bible, that it supplies the links in the scientific chain which our experimental science would ever fail to reach.

I leave the subject, with the confident expression that our experimental examination of Nature's attractive field will always be best performed by the devout mind that recognizes God and his Word in the investigation. The mind that is in harmony with the grand whole of creation, from the Creator's hand down to the last combination of his works, will be guarded against extravagance in the use of false inductions, and will find a principle of symmetry where else were arbitrary law or wanton movement. To eliminate God from his creation, and keep from view the power that formed in the action of his formations, is to accept a position at war with fundamental reason, which cordially echoes the words of Scripture: "He that planted the ear, shall not he hear? He that formed the eye, shall not he see?"

Then has Science her fairest aspect, when in the light of God's revelation she performs her high task as an act of worship to him, and lifts her eye from every new discovery in Nature's cunning mechanisms, devoutly saying, "In wisdom thou hast made them all."

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