

# ESSENTIAL APPEAL OF THE UNIVERSE

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GEORGE Bernard Shaw, who has admitted that he is a better playwright than Shakespeare and the most popular man in America, cast his gauntlet into the arena where astronomers most do congregate by making the following statement:

“When the astronomer tells us that the light from a star takes one hundred years to reach us, the lie is too great to be artistic”.

This quasi-ultimatum, whether artistic or not, is not rendered ambiguous by circumlocution; notwithstanding its immodesty it is picturesque. While we freely concede—and he would readily agree—that his is one of the most brilliant minds of our time, we are equally bound to remember that his weakness lies in his strength, seeing that he is a celestial body that refuses to recognize control in any orbit other than that assigned by his own will. It will be safer, not to say more charitable, to regard his fulmination as merely a phenomenon of self-conscious genius—a Quixotic tilt at something that is a good deal less vulnerable than windmills—a yielding to a temptation to humour a passing vanity by creating an arresting epigram. And yet, coming from such a source, it seems to demand some sort of reply, controverting as it does the laboriously obtained findings of those who have devoted their lives to astronomic research, and who are assiduously and honestly blazing a trail for us to celestial truth. We claim to be justly entitled to bring into question the right of anyone who is a stranger to the processes by which those findings have been obtained to project such a bald and crude denial without vouchsafing a tittle of rebutting evidence and entirely devoid of support of any kind. This seems to be the only form of reply that fits the case.

It is quite true that celestial values are on such a scale as to generate a sincere incredulity in the mind of the layman who is merely a looker-on—they are no less staggering to the expert—so great are they that the phrase “astronomical quantities” has passed into common parlance to give a title to values that are beyond the power of human comprehension. It must further be said that the astronomer has not only predicated these stupendous quantities

and announced them with unfaltering conviction, but he has prophesied that they will be utterly dwarfed when the new implement of optical power now in process of construction is focussed on the present dark areas of the heavens. The main benefit anticipated from the 200-inch instrument is not so much to discover hitherto inaccessible objects as to develop and establish the theory of relativity, which will probably assign boundaries to what we now logically regard as infinite and take us to points in space beyond which we may look in vain for any physical existences.

The implication underlying the quoted statement is that the distance of a star whose light, travelling at a velocity of 186,000 miles per second, occupies 100 years in reaching its goal, is not within the powers of human comprehension and *therefore cannot be true*. If that is Mr. Shaw's considered opinion in regard to scientific truths of that character—if he seriously invites us to entertain the idea that comprehensibility is a criterion of truth—all that is left for us to do is to listen to him and pass on. We venture to suggest that incomprehensibility begins much sooner than in the case of a 100-light-year star. It begins at the astronomical constant that does duty as the measuring rod—the speed of light, a mathematical certitude whose accuracy cannot be brought into question without undermining the foundations of reason and logic—for, to imagine a plane mirror placed on our moon, the nearest celestial body, on to which a pencil of light might be projected to be reflected back to us, and to remember that the double journey of that ray would be negotiated in the space of about two-and-a-half seconds, is quite as much beyond the powers of human comprehension as is the distance of a self-luminous body whose light occupies 100 years in its passage. Comprehensibility is a term that does not admit of degrees of comparison—a truth is either comprehensible or it is not.

If we go no further afield than our immediate environment, the Solar System, we are confronted with facts that are unrealizable. The farthest object in the Solar family that is visible to the naked eye, the planet Saturn, and that appears to be among the stars, is at such a distance that if we took a bee-line to it at a velocity equal to that of the earth in its orbit, viz., *1,100 miles a minute*, the trip would occupy 15 months. To reach the farthest member of the family at that velocity would occupy about six years. But if we wished to visit the *nearest* object beyond the precincts of our system, we should have to extend the trip to well over 30,000 years. And so we find that the distances of an outer planet, of the nearest star, of a 100-light-year star, of the Milky Way at 75,000 light-years, of

the Andromeda nebula at 800,000 light-years, and of some of the nebulae in Pegasus at 100,000,000 light-years are equally beyond human comprehension, none more than any other. If it be true that the acceptance of demonstrable and verifiable truths is dependent on our ability to take in their full significance, it closes the book of science and reduces research to an absurdity. The dilemma confronts us, and is equally perplexing, either when we consider the universe from the point of view of its unspeakable vastness or proceed to analyze its elements.

Proceeding *a maximis ad minima* we surely find that comprehensibility is no less elusive. The foundations of the physical universe are to be found in the ultramicroscopic, and all its myriad manifestations and infinite variety of aspect and condition are due to the existence and properties of the one entity, matter. But the unit of matter is not only unattainable—it is for ever inconceivable, and quite as much beyond our grasp as are the elements of its vastness to which we have referred. For, when pursued to its ultimate, we find that it leads us to the conclusion that it does not exist objectively—that is to say, it exists only as a phantasm of the mind, as the vesture of spirit, and that spirit is the only ultimate reality. The work of the physicist ceases at this point and he must abdicate in favour of the metaphysician, who commences where the physicist lays down the threads, and who leads us along the more subtle paths by which we may discover what it is that really exists, the nature of the mind and its relation to the external world. The physicist has taken us down to the atom, whose literal meaning is “that which cannot be divided”, but logical necessity has obliged him to predicate smaller somethings which form essential constituents of those atoms. And when this endless process of subdivision has reached the limit of imagination, we have the disconcerting fact that the mind cannot conceive of any portion of matter so small that it cannot be divided. We are even confronted with a dilemma when we attempt to supply a definition of the term *matter*, considered objectively, that shall cover the inscrutable elements to which we have referred.

We may therefore ask ourselves whether, at either end of the scale, in its infinite vastness or its ultimate analysis, it is possible for the limited capacity of the human understanding to apprehend, much less comprehend, the tremendous significance of the universe in which we are permitted to live and move and have our being.

As to the why and wherefore of it all, the scientist disclaims any qualification to express an opinion, nor does he suggest a solution, carrying to the limit his function of supplying the essential

material by means of which the judgment may come to a conclusion, even though that conclusion may be that the problem is unsolvable. Nevertheless, the restless inquisitiveness of the human mind, of whatever capacity, has supplied, and always will attempt to supply, an answer that satisfies itself—as evidenced by the thousand-and-one religious systems in existence, most of which proclaim a personal authorship moulded on human lines. It is interesting to study these conceptions, if only to discover the inadequacy of anthropomorphism to express the attributes and circumscribe the nature of the author of such a universe. It is a lure of Tantalus that persists in eluding our grasp.

The universe does not invite us to grasp and comprehend its stupendous truths, to decipher its myriad hieroglyphics, to solve its innumerable riddles—it invites us to *Stop, Look and Listen*. The supreme value of knowledge of the physical universe does not lie in the knowledge itself—it is but a means to an end—but rather in what that knowledge implies—in the intellectual and spiritual discipline by which the tissues of the mind are enriched and fertilized. The arithmetic, geometry, mechanics, dynamics and the codification of its laws are but means to this end—and when these are available to inform the picture, they enable us to respond by allowing their appeal to mould our basic concepts of thought and life.

The appeal is to the educated imagination; leading it away from its narrowness, egotism and self-complacency; causing it to realize its limitations and impotence as it stands before the awe-inspiring realities of infinitude; providing food for the aspirations whose queries are craving satisfaction as to whether its entities and phenomena are a self-originated happening, as to whether it is the answer to an omnipotent fiat, as to whether it has existed without a commencement and will persist without end throughout the interminable eons of eternity. It delineates us in correct perspective in the picture, and reveals to us that we wear our evanescent glories and hold our transient life, on a sphere which is but an infinitesimal speck of matter, but for a short day in an ever-changing macrocosm which, so far as we know, has no boundaries in either time or space.

To realize this relationship is a basic desideratum in human education—to fall short of this is to miss the point, to disinherit ourselves of a heritage that is pleading for our acceptance. The unspeakable richness of that heritage cannot be realized along the lines of tradition, of a self-assertive authority or of unharnessed emotion. The mind that knows most about the *works* of that Supreme Mind, that seems to be a logical necessity in accounting

for the entities and phenomena that arrest our attention on every hand, will surely be best able to assign the qualities and attributes of that Mind. One of the most eminent of the experimental scientists of our day has recently said: "The most deeply religious people of our largely materialistic age are the earnest men of science." He was referring to religion not as emotion but rather as the reaching out of the powers of a finite mind to apprehend so far as may be, by the well-ordered application of deduction and inference to carefully-filed facts, some supreme first cause. On the other hand, one of the most eminent clerics of to-day has said: "The Church has learned its lessons, and has lightened the ship by throwing away many an ancient tradition—the educated Christian has accepted Copernicus, Galileo, Newton, Darwin, Jeans and Eddington." The latter is a candid admission that every honest student must recognize as a necessity. The essential appeal of the universe presents itself to all sorts and conditions of men, in a form and by a method that corresponds with their personal idiosyncrasies and the stage of their intellectual development. No intellectual enterprise can evoke loftier thought or sublimer conceptions—none is better calculated to fertilize and enrich the mind.