Is Science a Blind Alley?

James Truslow Adams

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By all ages the opinions and knowledge possessed by the leaders have differed from those of the "men of the market place"; and in spite of all our popular education that same difference holds good to-day. This fact was brought clearly into relief in the popular comment and discussion on the so-called "monkey-trial" at Dayton, which provided heart-searchings for some, amusement for many, and complacent self-satisfaction for hordes of John Does. It was easy to laugh at the Tennesseeans, but was the Dayton trial, after all, merely an uproarious farce – the last stand in the mountains of a dying Obscurantism? Are not aspects of that and other manifestations of what we have come to call "Fundamentalism" worth pondering on broader lines than whales and Jonahs and the first chapter of Genesis? Were the citizens of our cities and graduates of our high schools really so much more intelligent than the shirt-sleeve mountaineers? Do they really know so much more about the universe?

It was pointed out in the seventeenth century that different periods in the history of man have had different intellectual "climates," and that the whole mentality of each period is dependent upon the particular climate then prevailing. We cannot understand a book written 500 B.C. or 1200 A.D. merely because we can read its words. We have got somehow to come to understand the whole "intellectual climate" of that period. No man's thought can be understood without it; and no man, then living, was unaffected by it. There was, for example, a very distinct "intellectual climate" in the medieval period in Europe, in which Dante's *Divine Comedy* or the works of St. Thomas Aquinas flowered as naturally as the giant ferns in the Carboniferous era. Then came great "climatic" changes in intellectual Europe and, later, in the New World, and the climate in which we live now is wholly different. It can be called, for want of a better name, the scientific. That is, all of our thinking is of the sort which almost involuntarily

rejects any general ideas or principles which cannot be "verified" by harmonizing them with a succession of facts tested by instruments. The only truth about the starry heavens, for example, which carries any conviction to most men to-day consists only of such "facts" as are revealed by the telescope, the spectroscope, and other instruments, or such hypotheses as seem to be corroborated by other facts similarly revealed or by mathematical "laws."

Now, this is something distinctly new in the way of an "intellectual climate." A civilization as a whole is probably related in some way to the intellectual climate of its period as the fauna and flora of past ages were related to the physical climates of their day. Everything at any given moment somehow "hangs together." Nobody has yet satisfactorily defined what we mean by "civilization," and we have no standard by which to judge whether one of the several civilizations that have risen and fallen in human history is higher than another. Man is a conceited creature, and very likely the men of each civilization would consider their own, which they were used to, the best.

The average man in each, however, can no more escape the intellectual influence of the "climate" of the times than he can escape from breathing the physical air of his time and place. Unconsciously he is formed by it. He accepts it as part of the order of nature and cannot understand any other. The average busy man of the present day, and not a few of our minor scientists, may think that they have replaced a worn-out religious faith by "scientific knowledge," when all that they have really done is to replace one childlike faith by another and one bigotry by another.

The "man in the street," whether that street be the Acropolis of Athens, the Forum of Rome, the narrow byways of medieval Florence or Paris, or Pall Mall or Broadway to-day, has never much cared to *think*. He is impressed by practical results and conforms to the current religion or opinion. The practical technological, economic, and sociological results of science have been colossal, impossible almost to overestimate. Had the views advanced by scientists not had these practical results they would have interested the average man as little as do the ideas of Plato or Hegel.

It may yet remain to be determined whether science has proved a blessing or a curse. It is too soon to say, and the problem is too complicated. But certainly it is the fact that scientific "ideas" work so astoundingly in the practical life which has given them such an enormous philosophical validity in the eyes of the people at large. Science in the opinion of the multitude has become something sacrosanct, and the average man to-day is as much a bigot about "science" – as he understands it – as the average man in Europe in the year 1000 was about the dogmas of the Roman Catholic Church, and for the same reason, namely, that he is breathing the air of the intellectual climate of his day. He has picked up the ragtag and bobtail ideas which are floating about, just as his predecessor did. In the Tenth Century Catholicism was the accepted mode of thought, and no sensible person questioned it. It is precisely the same with "science" to-day. If a merchant's clerk in the year 1000 was asked *why* he believed the dogmas of the Church, just what those dogmas were, and on what philosophical basis they were founded, he could not have answered to save his life. They were the only sensible things *to* believe, and he was too busy and too practical to bother about philosophy. He knew that everyone else believed; he knew a lot of practical things the Church did (or might do) for him, and anyone who did not believe was a crank or worse. In the same way, to-day, of the thousands who laughed at the Daytonians how many could have told what is the philosophical basis of science, what are the assumptions on which it is based, and just how far, and why, it is a valid interpretation of the universe?

They know – as the Catholic bookkeeper in the year 1000 knew, about the Church – that science in certain practical ways has done a lot for them. There is the mechanico-materialisic interpretation of the universe, held by some scientists fifty years ago, which has now filtered down to the public and become fixed in its mind. The "average man" of the Middle Ages had his physical flames of Hell and his jewel-strewn Heaven. His modern counterpart has his "scientific laws" and his materialistic interpretation of the universe.

And bigotry along the new lines has already set in. If one were not historian enough to know how such things go, one might be surprised to find the

"scientific, enlightened" mob who laughed at the Tennesseeans refusing to listen to the leaders among scientific thought. Let us take the case of a man I happen to know. As an open-minded youth, he read Darwin, Huxley, and the other scientists who were leaders in that day. In a sense he is himself a leader in his community, a man of fairly large income, a member of a somewhat exclusive intellectual club, but he says he has time to read only eight or nine books a year. Several of these are scientific, but he will have none of the philosophy of science. He would have no more use for Ritchie or Whitehead or Poincaré on the one hand than he would for the Daytonians on the other. If any "scientist" questions a purely mechanist-material view of the universe, he is to be summarily dismissed. He is as inflexible as the clerk of the Middle Ages. For him the scientific assumptions of a generation ago have become an established dogma, as little to be questioned *by the leaders of science itself* as by the Daytonians. As Poincaré says, "for a superficial observer, scientific truth is beyond the possibility of doubt.... To be skeptical is to be superficial. To doubt everything and to believe everything are two equally convenient solutions; each saves us from thinking."

It is of no use to say to such a man that Poincaré, the leading mathematician and one of the leading scientists of our time, has admitted that science can teach us nothing of the real nature of things, that all it can do, and that only in part, is to elucidate certain relations between them. Moreover, as he explains, science deals with only a very limited number of facts, those which recur with sufficient frequency to enable us to establish "laws," which, as another scientist says, are "hypotheses with a high degree of probability." As Poincaré says again, we have to stop somewhere, and scientists merely work on certain groups of facts so as to establish certain simple rules valid for those groups of facts only.

They have established a good many such rules, and they have had astounding repercussion in the practical applications which have resulted. It is this, I repeat again, which has so deeply impressed the average man. Heaven and Hell are unprovable and very likely unreal. The "good life" was always a matter for the elect and cultured to debate over. But for the common man, the movies and the telephone and the Ford car and a huge increase in

population with jobs still going round are realities, and science has brought them about.

But does science give us any satisfactory explanation of the universe? No scientist of any standing would claim that it tells us *why* things happen; it tells us only *how* they happen. Science does not tell us the cause, in the popular sense, of a single happening. It can only tell us that if certain things occur others will follow. And it can do even that for only an extremely limited number of phenomena. The popular idea is that, given time enough, science will be able to explain everything. Will it, even as to the *how* rather than the *why*? A. D. Ritchie, a biological chemist of international note, says, "it seems clear to me that the order in nature of which science reports is really there, and is not a mere figment. But it seems to me equally obvious that the orderliness is not all-pervasive. There are streaks of order to be found among the chaos, and the nature of scientific method is to seek these out and to stick to them when found and to reject or neglect the chaos. It is obvious that we have succeeded in finding some order in nature, but this fact in itself does not prove anything farther. It suggests that, having found some order, it is worth looking for more, but it does not imply that nature is orderly through and through, though, of course, it might be so. Nevertheless, the extreme difficulty and labor of finding laws of nature even when you know where and how to look, much more when it is a question of discovering a new one, suggest that there is not so much simplicity and order about as people think.... The fact that the regions of nature actually covered by known laws are few and fragmentary is concealed by the natural tendency to crowd our experience into those regions and to leave others to themselves. We seek out those parts that are known and familiar and avoid those that are unknown and unfamiliar. This is simply what is called 'Applied Science'."

The reason I claim that popular science has already become a sort of dogmatic religion with the ordinary man, and that he is as much a bigot as the Daytonian, is that he will not listen to this sort of thing even from leading scientists. He has accepted as a new dogma the science of thirty years ago as it has filtered into popular works and he accepts, utterly un-

critically, because he has had no philosophical training, any philosophical nonsense handed him by the popularizers of science. He believes that science will ultimately explain everything, because he believes the entire universe is governed by laws to be discovered. This, of course, involves abandonment of any doctrine of the freedom of the will; but many scientists without philosophical knowledge apparently overlooked this entirely, and in the preface to one of the most popular books on recent science we read that we men, owing to science, "have stepped from the rank of Creation's scheme." If science is universal, how are we, any more than anything else in the universe, going to step out of the rank of "Creation's scheme"? Wouldn't that be a colossal miracle, and if an unimportant creature like man can voluntarily step out of the sphere of influence of "natural laws" and begin to control or thwart them himself, what becomes of that all-pervasive "reign of law"? Why be so conceited? If we can step aside from "Creation's scheme" because of what science has learned in a few generations, the universe would seem to be much more loosely governed than popular science believes.

If science is universally valid, it can be so only at the expense of destroying all we have hitherto considered worth striving for, and must theoretically destroy all initiative. Yet science has given us such power over the forces of nature as to stir us to an activity hitherto unknown in the world's history. We have been able to produce and maintain a population undreamed of. We are flying through the air at three hundred miles an hour. We can speak with a person three thousand miles away. We can do all the incredible things we do to-day, and so we, part of an inexorable nexus of laws, are dreaming of annihilating almost every law of nature! There is the paradox, which the popular scientist and the man in the street both ignore, being "practical" men in a "scientific" age.

But to get back to our Daytonians and our high-school graduates. As far as thinking powers are concerned, I frankly do not see much to choose between them. The high-school graduates have accepted certain facts the Daytonians did not, but beyond that the High Schoolites are just as bigoted as the Daytonians. They not only refuse to *think* but they have reached the

point in accepted and crystallized dogma where they refuse to follow even the leaders of science themselves in their philosophic enquiries. Anyone who does not accept the few established facts which these High Schoolites have accepted, are, in their opinion, ignorant boobs. Any scientist who is philosophical enough to carry on speculations which appear to endanger the simple mechanical scientific ideas to which the High Schoolites have become accustomed is a "crank" and no longer a "scientist."

But, again, it may be asked whether the Daytonians' protest – I cite that simply as an example of a state of mind not confined to the Tennesseeans – is based solely on scientific ignorance and Obscurantism? Are these various protests, in more or less ignorant form and based on positions which, intellectually, are unfortunately taken, the dying gasps of a conflict which is almost passed or the first cries of one new born? It is so hard to get away from the "climate" of one's own age, and so dangerous to be a heretic, scientifically, that the question may seem a foolish one, but I am not sure that it is. I am not so sure that the next century or two are going to be as rigidly "scientific" as our own.

These protests, as I sense them, have to do fundamentally, not so much with certain items of knowledge or ignorance, as with our attitude toward the whole range of values in human life. There are certain questions about life which man has always asked, certain modes of self-expression and enjoyment which he has craved, certain ideals he has entertained, certain forms of experience he has insisted upon. In the ebb and flow of humanity through the ages, in minor changes of modes of thought and social custom, we may sometimes lose sight of these fundamentals; but if we study men in all stages of evolution from savagery to the highest civilizations, we shall find certain aspects of his nature strangely constant. For one thing, he has always insisted on trying to find some real and satisfying explanation of his own nature and that of the universe into which he is born; he has never ceased to ask the why of birth and death, of suffering and sin and happiness; he has always expressed himself in art – written poems, painted pictures, carved sculpture; he has always insisted that he was himself a personality, and that the drama of his own life, somehow, had significance. There have been peri-

ods when a philosophy or religion arose which ran counter to some or all of these instincts, and for a time, oddly enough, may have seemed to increase the energy of the people believing it, as in the case of Mohammedanism. But sooner or later the people release themselves again, and the religion or other hampering influences become mere forms and lose their significance in practical life.

Now, what is the relation of science to these deep-lying instincts? It can offer us not a single word of explanation or illumination as to the nature of the universe or ourselves. Its "causes" are mere antecedents. It pictures a mere succession of events. Not only must it always be silent as to *why* anything happens, but even as to the *how*, what it really says is merely that if a certain selected group of phenomena is found now, another combination will follow. This is enormously useful to know, and I am not belittling the amazing amount of knowledge of a certain sort which science has accumulated. It is probable that mankind will never find any answers to their many *why's*. That is not the point. The point is that mankind, age after age, has always sought answers, has always refused to remain in a purely agnostic attitude. Has human nature changed so completely and suddenly that it is now going to remain forever content with those answers of science which are no answers?

Moreover, man has implanted in him a peculiar feeling that somehow there is such a thing as value or worth in the universe, that some things, some thoughts, some lines of conduct have more value than others; that a great poem is worth more than an obscene couplet scratched upon a wall; that a noble and brave man is worth more than a puny coward. But, however an individual scientist may ignore the implications of science in private and practical life, science has no place for values. In a universe governed wholly by predictable and inexorable law, value, in its human sense, is an inadmissible quality. The man who sacrifices his life to save women and children in a shipwreck is doing nothing more noble or of more worth than the man-eating tiger who pounces upon a child in the jungle. Both are equally the literally un-*willing* resultants of the entire complex of forces in

the universe centering upon them at the time and place, and their acts are as wholly devoid of moral value as the motions of the stars in their courses.

If we adopt sincerely and wholly the popular conception of science we really destroy all values in human life. The arts are already beginning to show this deteriorating influence. In fiction, for example, of what use to write of character if there is no such thing, if personality is a myth, if freedom of action is a dream, and if all we are is merely a succession of states of mind having as little significance as a glow of phosphorescence over decaying wood? The logical outcome is Joyce's *Ulysses*, in which for hundreds of pages we have merely the successive and passive states of mind of one man during a few hours. As an experiment it may have an interest. As the sole form to which the art of fiction is reduced by science, it means the end of art. It may all be true but neither man nor his arts can try to live by it and survive.

It is needless to go on multiplying instances. As to the immediate questions at issue at Dayton, I believe the Daytonians wrong and the High Schoolites right, but as to the larger implications of the whole present situation I believe the Daytonians were on the right trail, however clumsily and ignorantly they were groping for it. If man cannot live by bread alone, neither can he live on disinfectants or aeroplanes.

As an historian I am skeptical of general laws in history, but one which does seem to be established is that man never goes back to revivify old forms. His civilizations may rise and fall, but he never goes back to relive the thoughts of an earlier period. I do not look for a great popular revival of Christianity any more than of Greek philosophy or Confucianism. Christianity will probably last for centuries and provide comfort and hope for millions, but those who have grown away from it, and their successors, are not likely to be won back. On the other hand, I do not believe that any body of doctrine so spiritually and, speaking broadly, intellectually sterile as science will satisfy the many-sided cravings of mankind indefinitely. Its facts are exceedingly interesting and incomparably useful, but they are too much on the order of a picture-puzzle to satisfy men forever. There comes a time when the contemplation of the unthinkable distances of the stars or

the habits of an electron or even the geological record fail somehow to move us. It gets a bit too much like reading of Rockefeller's millions, because, at bottom, and ineradicably, man craves spiritual and moral values, and an answer, however crude, to his question *why?*

It is obvious that we cannot get along without science. Intellectually it has an interest we shall never again willingly forego. Practically it is essential, not only for our comfort but, as things are now, for our very existence. In fact we have reached the point where in order to support the population brought into the world by science we shall have to have more and more science, more and more inventions almost daily. But, basing my prediction solely on the unchanging nature of man's deepest cravings throughout the entire period of which we know anything of him and his mind, I do believe that science will some day cease to be the sole method of interpreting the universe and that scientists will cease to be the high priests whose words are the sole authority as to what men can and cannot believe about themselves and their environment. It has been said recently that science may some day become a sort of religious cult, with its own hierarchy and its influence on the life and thought of the people comparable to that of the great established churches. I doubt that, for, as I said, it is too sterile. It has appealed to me in general in our day for special reasons, but I do not believe it can permanently satisfy the whole of man's nature, and I believe the "intellectual climate" will gradually alter again – as it has so many times – and science will come to be considered an extremely useful practical tool, an indispensable one, and an extremely interesting interpretation of certain aspects of the universe, but that it will lose its present high station as the sole interpretation of the whole of it.

Whether in the course of the next few centuries some new religion may be taught, I do not know, but I do not believe that a few generations of scientific teaching have permanently altered man's nature. I believe that before so long he will insist, simply because he cannot help himself, on some restoration of spiritual and moral explanations and values in his world. A philosophy which teaches that there can be no answer to his deepest

questionings, that all his spiritual and moral values can be resolved into nothing, that he himself has no personality, not only after death but even in this world, that he is merely a bundle of "states of mind" cannot satisfy him always. When beauty, love, duty, loyalty, and all the rest of what has hitherto given some value to existence have been swept away by scientific analysis, I believe they will come in again by some other door, though where that door may open from I do not know.

In all that I have here said about science I have been speaking of it in the popular acceptation of what it stands for – a conception that unfortunately is entertained also by too many scientists of smaller caliber. Far out on the frontiers of knowledge are scientists who themselves glimpse something different. It may be that they will be the ones to open the door, and if they do, I am not at all sure that the Daytonians may not be more ready to enter than the High Schoolites. The Tennesseeans' science may be negligible but their uncritical sensing of man's deepest needs, of his unchanging nature, and of the values of life is more valid than that of many of the half-educated who got such a hearty laugh out of them, even although the crude protest may have been due to mere resentment against the disturbance of cherished religious dogma. "Intellectual climates" may change; civilizations may rise and fall; our skyscrapers may yet stand deserted; but man will still insist, in the face of every shred of contrary evidence, that he is a personality, that there is a scale of values which transcends the useful, that there is more in love and beauty than a complex of instincts and impacts, that there is a mystery and a meaning hidden in the universe, and he will still frame answers to his eternal why? The old religions may long linger, but none can be born again. If science cannot lead into some new world of interpretation, it will be thrust aside, except as a tool, and man will turn to some new philosophy of life, for his instincts are stronger than his reason, and man is more than his mind.