

POE AND EINSTEIN

BY GEORGE NORDSTEDT

“IT has been the hard fortune of Edgar Allan Poe,” wrote William Hand Browne in 1869, “that he has not only been most persistently and unscrupulously maligned by his enemies, but that he has (in our opinion) been but imperfectly estimated by his friends. All who write in his praise reserve their warmest admiration for his poetic genius; and it is possible that he himself may have considered this his greatest gift. And yet there are two faculties which he possessed in more singular perfection than the poetic faculty, be our estimate of his poetry what it may. These are the power of expressing his thoughts however involved, subtle or profound, with such precision, such lucidity, and withal with such simplicity of style, that we hardly know where to look for his equal: certainly nowhere among American writers. And this probably had its origin in his second gift: in the keen, clear, swift analytical power of his thought, combined—which is a rarity—with a vast comprehensive grasp of generalities.”

Having thus maintained that Poe also in a remarkable excellence possessed the scientific mind, Browne goes on to show that the poet in *Eureka* had “anticipated some of the latest and most important results of scientific investigation.” When for example Dr. Winslow in *Force and Nature* (1867) discards the theory of an ether as untenable, and conceives repulsive as well as attractive forces to be interacting throughout the universe, believing himself to be “laying the corner stone of a new philosophy,” he was actually rediscovering the land Poe had touched upon years before. M. Hirn’s views in his essay *Consequences philosophiques et metaphysiques de la Thermodynamiques* (1868) also, according to Browne, coincides very remarkably in at least one point with those of Poe. Hirn

repudiated the hypothetical ether, maintaining the absolute existence of three principles—matter, force, and spirit. He replaced the ether with pure force (dynamics), in which force the atoms exist. "In no sense," says Hirn, "can this intermediate principle be confounded with what has hitherto been called ether. . . . The intermediate element constitutes *force* itself."

Poe's view of this primary repulsive force is precisely the same. "It will be remembered," he writes, "that I have myself assumed what we may term an 'ether.' I have spoken of a subtle influence which we know to be ever in attendance upon matter, although becoming manifest only through matter's heterogeneity. To this influence . . . I have referred the various phenomena of electricity, heat, light, magnetism; and, more, of vitality, consciousness, and thought—in a word, of spirituality. It will be seen at once, then, that the ether thus conceived is radically distinct from the ether of the astronomers, inasmuch as theirs is matter and mine is not."

Now, as Poe wrote *Eureka* in 1848, the year before his death, his anticipation of some of Winslow's and Hirn's ideas (of whose importance Browne had an exaggerated notion) stands clear. Of course, it is not a question here as to the truth of either Poe's speculations or those of Winslow and Hirn.

"This—all this—was in the olden Time, long ago," might be said of Browne's paper: for although only some five decades have elapsed since his observations, more progress has been made in the natural sciences and philosophy during that short period than from the time of Aristotle to Faraday. Browne could not possibly be sufficiently acquainted with, understand or anticipate the discoveries and theories of such investigators and mathematicians as Gauss, Riemann, Bohr, Planck, Minkowski, Maxwell, Millikan, Rutherford, Arrhenius, Curie, Moseley, Einstein, and others. Consequently Browne did not touch upon all the ideas Poe propounds in *Eureka*, the scientific knowledge of the day limiting his analysis and understanding of the poet's work. For though Poe, to be sure, never even dreamed of protons and electrons (holding, however, that the atom might be divisible), he certainly anticipated some of the discoveries of the new physics, particularly several of Einstein's ideas as to the extent and shape of the universe. It must not be taken, however, that Poe in any way anticipated the Theory of Relativity.

"Attraction and repulsion," says Poe, "being undeniable the sole properties by which matter is manifested to mind, we are justified of assuming that matter exists only as attraction and repulsion; in other words, that attraction and repulsion are matter, there being no conceivable case in which we may not employ the term 'matter' and the term 'attraction' and 'repulsion' taken together as equivalent, and therefore convertible, expressions of logic."

In *Einstein and the Universe* Charles Nordman writes:

"All this [the result of modern research] irresistible compels us to think that the inertia of the various component parts of atoms—that is to say, of all matter—is exclusively electromagnetic in origin. There is now no matter. There is only electrical energy, which, by the reaction of the surrounding medium upon it, leads us to the fallacious belief in the existence of this substantial and massive something which hundreds of generations have been wont to call 'matter.' And from all this it also follows. . . . that mass and energy are the same thing, or at least the two different sides of one and the same coin. There is, then, no longer a material mass: there is nothing but energy in the external universe. A strange—in a sense, an almost spiritual—turn for modern physics to take!"

This strange turn of modern physics Poe anticipated, and he explains how. Speaking of Kepler's three laws, Poe writes: "Yes! these vital laws Kepler guessed; that is to say, he imagined them. Had he been asked to point out either the deductive or inductive route by which he attained them, his reply might have been, 'I know nothing about routes, but I do know the machinery of the universe. Here it is, I grasped it with my soul; I reached it by mere dint of intuition'."

Likewise did Poe intuitively grasp what has only recently been revealed by modern investigators. In this connection it is interesting to note that Einstein himself intuitively felt the truth of his theory ere he succeeded in giving it mathematical expression. In a conversation with Moszkowski, Einstein—emphasizing the importance of invention, and that discovery is not a creative act—continued: "It is not true that this fundamental principle of relativity occurred to me as a primary thought. If this had been so perhaps it would be justifiable to call it a 'discovery.' But the suddenness with which you assume it to have occurred to me must be denied.

Actually I was led to it by steps arising from the individual laws derived from experience. . . . Invention occurs here as a constructive act. This does not, therefore, constitute what is essentially original in the matter, but the creation of a method of thought to arrive at a logically coherent system. The really valuable factor is intuition."

Einstein here has the same view of intuition as Poe, holding furthermore that Goethe in spite of his non-mathematical mind yet "possessed a peculiar [poetic] form of intuition, by which he obtained a clearer vision than many an exact investigator. . . ."

"All great achievements of science," says Einstein, "start from intuitive knowledge, namely, in axioms, from which deductions then are made. It is possible to arrive at such axioms only if we gain a true survey of thought-complexes that are not yet logically ordered; so that, in general, intuition is the necessary condition of the discovering of such axioms. And it cannot be denied that, in the great majority of minds with a mathematical tendency, this intuition exhibits itself as a characteristic of their creative power."

Neither can it be denied that Poe in a high degree possessed not only the poetic but also the mathematical intuition, which explains *Eureka*, perhaps the boldest speculation conceived by the brain of man before Einstein.

Although the Theory of Relativity might be said to have won out, at least in physics, it still has to overcome the prejudice of thousands of scientists who are unable to grasp Einstein's tremendous generalizations. And—defending some of his not as yet verified deductions—Einstein might this very day, without hardly changing a word, copy the following extract from a letter written by Poe in Feb. 1848 to Geo. E. Isbell: ". . . One thing is certain, that the objection of merely scientific men—men, I mean, who cultivate the physical sciences to the exclusion, in a greater or less degree, of the mathematics, of metaphysics and logic—are generally invalid except in respect to scientific *details*. Of all persons in the world, they are at the same time the most bigoted and the least capable of using, generalizing or deciding upon the facts which they bring to light in the course of their experiments. And these are the men who chiefly write the criticism against all efforts of generalization—denouncing these efforts as 'speculative' and 'theoretical'."

Einstein, however, does not care much for the opinions of "mere scientific men." Many of the world's greatest physicists are on his side, Weyl holding the Theory of Relativity to be "one of the most forceful testimonies of the power of speculative thinking."

As to Poe's and Einstein's ideas of the Cosmos, the most striking coincidence lies in the fact that both view the universe as being of limited extent and of a closed spherical shape. Poe ridiculed the idea of an unlimited distribution of matter, arguing: "Were the universe of stars (contradistinguished from the universe of space) unlimited, no worlds could exist. . . ." And so Poe conceives of a limited spherical universe of material bodies, all tending to concentrate into one "Unity," and thereupon immediately disappear as matter (*attraction* and *repulsion* having annulled one the other and vanished), provided the latter is not at once by "Divine violation" again diffused into a spherical space in the form of atoms, as it in Poe's opinion originally was diffused, and so on forever.

Einstein, of course, does not speculate about alternate eras of repulsion and attraction. His limited and yet endless universe he pictures as somewhat like the surface of a sphere, returning upon itself. "A sphere is necessarily limited," says Poe; but it is also necessarily endless, in the sense that starting out from a given point one will, of course, get back to the starting point but never reach an end. Poe imagined this spherical universe to be of so "inconceivable an extent as to be only not infinite." Explaining Einstein's views Moszkowski writes in this connection: "We have to imagine that our solid bodies, say stars, arrive at a point in their travels which we may term only 'enormously distant.' If we call the direction right and left instead of positive and negative, then the process reduces itself to this: the moving body reaches the point, which is enormously distant on the right, and which is identical with the point enormously distant on the left; this means that the body never moves out of the space continuum of this world, but returns to its initial point of departure even when it moves ever onward in what is apparently a straight line. It moves in a 'warped' space.

The magnitude of this spherical universe is wholly inconceivable, and "only not infinite," as Poe expressed it.

"It is possible," says Einstein, "that other universes exist independent of our own." As to such a probability Poe writes:

"Have we, or have we not, an analogical right to the interference that this perceptible universe, that this cluster of clusters, is but one of a series of clusters, the rest of which are invisible through distance, through the diffusion of light being so excessive, ere it reaches us, as not to produce upon our retinas a light-impression, or from there being no such emanation as light at all, in these unspeakable distant worlds, or, lastly, from the mere interval being so vast that the electric tidings of their presence in space have not yet through the lapsing myriad of years, been enabled to traverse that interval? . . . I myself feel impelled to fancy. . . that there does exist a limitless succession of universes, more or less similar to that of which we have cognizance, to that of which we alone shall ever have cognizance. . . . If such clusters of clusters exist—and they do—it is abundantly clear that, having had no part in our origin, they have no portion of our laws. They neither attract us, nor we them. Their material, their spirit is not ours, is not that which obtains in any part of our universe."

This is precisely Einstein's position, and as to the impossibility of ever gaining knowledge of presumably independently of our own existing universes, Einstein has this to say: ". . . It is possible, in fact, to a certain degree probable, that we shall by means of astronomy discover new worlds far beyond the limits of the region so far investigated, but no discovery can ever lead us beyond the continuum described above [the closed universe]. . . . Thus we must reckon with the finitude of our universe, and the question of regions beyond it cannot be discussed further, for it leads only to imaginary possibilities for which science has not the slightest use."

Poe, it is true, had no conception whatever of the "warped" or curvilinear nature of space—a space in which light itself must eventually return to its starting point or source, the consequence of which is that our universe is optically isolated from other supposedly existing universes—but he comes very near it when he speaks of the possibility of "there being no such emanation as light at all in [from] these unspeakable distant worlds—comes very close to the idea that light also is a prisoner in our spherical universe, and, so far as analogy holds, in all. Criticising the conclusion of Mädler, who claimed to have ascertained a curvature in our solar system's progress through space, Poe, while admitting there must be a curvature,

says: "It would scarcely be paradoxical to say that a flash of lighting itself, travelling forever upon the circumference of this unutterable circle, would still forever be travelling in a straight line. That the path of our sun in such an orbit would, to any human perception, deviate in the slightest degree from a straight line, even in a million years, is a proposition not to be entertained; yet we are required to believe that a curvature has become apparent during the brief period of our astronomical history—during a mere point—during the utter nothingness of two or three thousand years."

In above strictly scientific observation Poe unconsciously makes his nearest approach to Einstein's curvilinear closed four-dimensional continuum. As to the impossibility of ever becoming aware of the existence of other universes there is complete agreement between Poe and Einstein.

To what extent are Poe's ideas independent of the scientific and philosophical knowledge of his day? Writing in 1884, George Woodberry* proved—at least to his own satisfaction—that Poe's essay is but a composite echo of the theories of Hershel, Boscovitch, Faraday, and Laplace. If so, then it must be equally true that Einstein's Theory of Relativity is but an echo of the theories of Newton, Gauss, Riemann, Minkowski, Lorenz, and others.

Woodberry speaks of "the density of Poe's ignorance," ridiculing the poet's conception of space as "not created but given"—another of Poe's pre-Einstein notions, for according to the Relativity Theory, "the universe of space and the material or stellar universe are one and the same thing, because there is no space without matter or energy." That is to say, if matter (energy) exist, space is *given*.

"I can only say that no gentleman can accuse me of the disingeniousness here implied," wrote Poe in answer to a critic, a "Theological student," who had asserted that *Eureka* was nothing but Laplace over again, "inasmuch as, having proceeded with my theory to that point at which Laplace's meets it, I then give Laplace's theory in full, with the expression of my firm conviction of its absolute truth at all points. . . . In fact, no point of my theory has even been as much as alluded to by Laplace."

* Professor Woodberry died a couple of months ago, ripe of age and wisdom. It would be interesting to know if the old gentleman, hearing of Einstein, maybe felt a little uneasy about his own conventional and puerile criticism of *Eureka*.

"What I here propound," says Poe of *Eureka*, "is true: therefore it cannot die; or, if by any means it be now trodden down so that it die, it will rise again to Life Everlasting. . . . Nevertheless it is as a poem only that I wish this work to be judged after I am dead."

Poe's Work has been trodden down and forgotten from the very first, and many an "exact" scientist is fully convinced that Einstein's theories ere long will be even worse off. *Eureka* may never "rise to Life Everlasting," but Poe's intuitive glimpses cannot die, provided the new physics and Einstein himself are not overthrown in the future.

Even then *Eureka* will always be a splendid *poem*.