



Ralph N. Waldman  
226 East 203rd Street  
Bronx, NY 10458

March 17, 1992

Dear Rabbi Charlop,

Since I have started coming to the shul to recite Kaddish for my departed mother, I have been looking forward to listening to the speech you deliver every Shabbos morning. I find your speeches very informative and have thus far found myself in complete agreement with your point of view.

The speech you gave on March 14 particularly held me because I have been pondering over the seeming dichotomy between Einstein's Theory of Relativity and Heisenberg's Theory of Uncertainty for a number of years.

Einstein's Theory of Relativity bears the implication that there is order (and possibly design) in the structure and operation of the universe. But when we revert to the origin of the universe, which is believed to have begun as a singularity that exploded and expanded, and which is still expanding as a result of its original impetus (the Big Bang Theory) the Einsteinian theory appears to fail. Why? Because a singularity is a region of infinite curvature and of zero dimension where the known laws of physics break down. At this sub-atomic level there is as yet no fusion of space-time because they do not yet exist. And there is no velocity of light, which plays so vital a role in the Theory of Relativity, because no energy (light) has yet been emitted.

The underlying principle is chaos and uncertainty, i.e. the Heisenberg Uncertainty Principle. Our Holy Torah describes this phenomenon as, "And the earth was without form and void; and darkness was upon the face of the deep". (Genesis 1:2)

The Heisenberg uncertainty principle, which states that the microcosmos is indeterministic is true because it is in agreement with Torah. In so far as Heisenberg's Nazi affiliation goes, and in so far as his motive may have been to discredit and deny the LORD God of Israel in order to justify the destruction of God's Holy People, the Jewish People, Heisenberg was indeed an evil Amalakite. But his theory of uncertainty holds.

Einstein's Theory of Relativity, on the other hand, gives rise to the concept of an ordered universe. The reason for this is that Einstein dealt with macrocosmology, that is with the laws of the universe as they apply to enormous space-time distances measurable in terms of light years. Einstein's theory is valid as well. In sum, both theories are valid because each deals with a single facet and not with holistic structure.

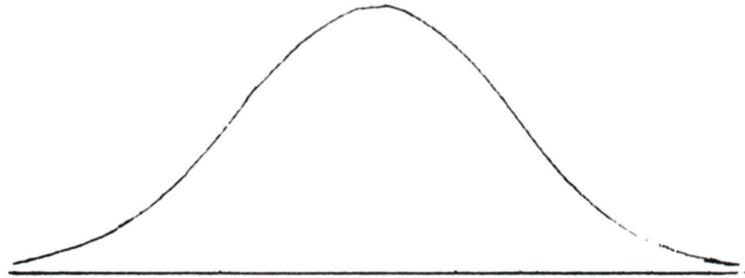
The logical question, the one which really irked me for a couple of years, was "How can an ordered universe stand on a foundation of chaos and chance causality?"

The Torah says that it can. "And the Spirit of God moved upon the face of the waters". The Shekhinah, the Divine energy, flowed into the singularity and expanded it, i.e. caused the Big Bang to take place. The Torah then states, "And God said let there be light; and there was light". Now, at this stage of the creation, matter had been formed, space-time created and energy in the form of light permeated the universe. The universe now obeyed the laws Einstein discovered. Thus, an ordered universe was brought into existence out of disorder.

In your speech you stated, in effect, that the feature of randomness or uncertainty in the universe is caused by the limitations of the human mind. Whereas, in utter reality, to a Cosmic Intellect, chance may not be chance but perfect order and determinism. Your answer to this vexing problem may be correct. This very same thought occurred to me as well. But it left me unsatisfied because it did not contain the rigor which a mathematical model could provide.

Happily, about a year ago, I found just such a model. I shall briefly explain it.

Of particular importance in statistical mathematics is a curve called the "Normal Frequency Curve". This curve is bell-shaped and perfectly symmetrical. It is a deterministic, ordered curve and looks like this.



The importance of this ordered, perfectly symmetrical curve is that it is formed by random or chance variations. Statisticians know that when certain chance variations are plotted on a graph, their boundary will assume the shape of the normal frequency curve. The greater the variety and number of trials, the more perfect the resultant curve.

When intelligence quotients, heights, weights, waist measurements etc. of any random sampling of a population are graphed, they will form a normal frequency curve. Similarly, errors in measurements, shots missing the bulls eye, the sums of the numbers drawn in the NY Lottery, will all form the normal frequency curve ...not some chance pattern. This "magic" curve was discovered by the great mathematician, Gauss, more than one hundred years ago.

When I learned of it, I felt a ray of light. For I immediately realized that it could serve as the theoretical connecting link between the opposing theories of Einstein and Heisenberg.

Here was the rigorous mathematical proof that chance can be used as an instrument to achieve an ordered and deterministic goal.

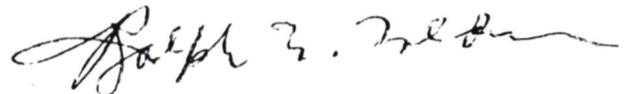
And this, with all due humility, is what I believe HaShem does. HE created a quantum field (singularity) and then expanded it

so as to create an orderly universe. And HE continues to utilize quantum fields to maintain the universe in an orderly manner and to direct it toward a predetermined goal.

To quote Einstein, "God may be subtle, but HE IS not malicious. God does not play dice with the universe."

Thank you for reading this letter.

Sincerely,

A handwritten signature in cursive script, appearing to read "Ralph N. Waldman". The signature is fluid and somewhat stylized, with a long horizontal flourish at the end.

Ralph N. Waldman