THE UNIVERSE IS "CLOSED"

There should be *immediate* clarification as to the nature of this paper. By virtue of the title, the reader may feel that this paper will outline a universe which is in possession of a sufficient amount of matter/mass to stop the expansion of the universe, and cause galaxies to accelerate backwards to their starting point in order to culminate in "the big crunch". That is *not* what this paper will outline. The reader is naturally asking what this paper pertains to since a closed universe simply entails a universe which will culminate in "the big crunch". The reader should observe the word closed in the title. The word closed is in quotation marks. In this paper, a closed universe will have a completely different meaning from the conventional meaning. The central precept in this paper has been developed as a *direct result* of the preceding paper on The Origins of the Universe. (In order to read and comprehend this paper, it is assumed that you have already read that paper). If the theory behind the origins of the universe is fundamentally accurate, then other conclusions about the state of the universe can be (or even must be) developed.

In order to proceed with this paper, certain precepts from the previous paper will be briefly reviewed. The starting material of the universe was hydrogen gas. This gas had no point of origin but was, instead, infinitely old. Furthermore, the gas was in a constant state of motion. After an arbitrarily long period of time (let's say $10^{1000000}$ years), a very small portion of the gas will spontaneously flow from disorder to a state of order (a conglomeration of gas). If the escape velocity of this conglomeration is minimal then all of the hydrogen will spontaneously flow away to a state of disorder. This process would continue until a sufficiently large conglomeration had been established which had a large escape velocity. The escape velocity of this conglomeration would have to be sufficient to prevent hydrogen from diffusing away for a period of time. For this to have transpired, certain pre-conditions must have prevailed. (The reader should be forewarned that the pre-conditions to be outlined are contrary to human thinking. Consequently, most readers would have extreme resistance to what is being proposed.)

In order to illustrate the nature of these pre-conditions, an analogy will be drawn via a hypothetical scenario. Let's assume we have a fish tank which is the size of 100 galaxies. In this enormous tank is hydrogen gas. After an extraordinarily length of time, a similar situation may prevail as prevailed in the early universe. The gas may spontaneously flow from disorder to order. However, what factor(s) is it about this entire "system" (the tank and the gas) that would enable such a process to transpire? *The gas is contained within a designated area and is not free to flow beyond that area. To be specific, there is a* ***barrier*** *which maintains the gas in a designated area*. In order to illustrate this principle, let's assume that our hypothetical fish tank was devoid of a lid. All of the gas would flow out of the receptacle. Every hydrogen atom would flow further and further away from every other hydrogen atom. The formation of any kind of conglomeration within the tank would be rendered categorically impossible. Consequently, without the existence of a barrier to maintain gas within a designated area, the eventual conglomeration of that gas is impossible.

In accordance with the theory of the origins of the universe, gas was, on an exceptionally rare basis, conglomerating. Therefore, for this to have transpired, there must be an end to physical space. In the farthest reaches of the universe, there must be some type of barrier in existence. If not, the situation would be comparable to an enormous fish tank without a lid. The hydrogen atoms would simply diffuse further and further away from each other. An eventual conglomeration would be impossible to achieve.

There would be opposition to a concept of this nature since an end to physical space (the existence of some kind of barrier) is contrary to human thinking. Whenever we think of outer space, we have a certain "conceptual vision". Beyond our earth are other planets. Beyond those planets are other stars. Beyond those stars are other galaxies. Beyond those galaxies are even more galaxies. Eventually, there are quasars. In other words, there *always* seems to be "something beyond". Therefore, if one were to conceptualize a barrier in outer space, presumably there would be something on the other side of that barrier. Therefore, the concept of an end to physical space simply must be wrong.

This type of issue was addressed under Part I of the paper The Origins of the Universe. Not the possibility of an end to physical space, but the fact that we cannot reject a concept merely because the concept is in opposition to the parameters of human thinking. Since this issue was dealt with in some length under Part I of that paper, it would be redundant to repeat those same arguments. Therefore, the issue will only be briefly addressed. Merely because a concept is contrary to human thinking that doesn't mean it's impossible. Mankind is in no position to tell the universe how it "should function". The universe is not going to "bow down" to mankind. *The laws of nature do not conform to human thinking. Human thinking must conform to the laws of nature*. When conceptualizing space, human beings have a tendency to think there is always "something beyond". Merely because these are the parameters of human thinking, that doesn't necessarily mean that there isn't an end to physical space. Merely because there are some who think there should be something on the other side of a potential barrier, that doesn't mean there actually is something on the other side. Space just ends. If there wasn't a physical end to space, it would be impossible for hydrogen to conglomerate. The atoms would simply diffuse further and further away from each other.

I have presented a similar type of argument to certain professors (however the argument has been presented in the absence of my theory of the origins of the universe). They have insisted that under no circumstances would there be a need for a barrier. The analogy they have drawn is with an ant on a ball. The ant possesses the freedom to move anywhere on that ball without there being any kind of barrier associated with the ball. The situation is not the same for the simple reason that the ant does not possess the freedom of movement that a hydrogen atom would possess. If hydrogen were on the surface of the ball, it would flow upwards and away from the ball.

If there is a barrier in space, this raises other points pertaining to cosmology. In the standard big bang model, there has been the claim that the explosion and subsequent expansion did not transpire at any specific place in space. According to the tenet of a physical end to space, this point must now be questioned. If there is a barrier somewhere "out there", then dimensions would be attributed to the universe. There would be a physical centre to the universe. Let's arbitrarily state that the barrier is in the shape of an ellipse. (We have no idea what the actual shape would be. However, for the *presentation* of the following concept, a specific shape must be arbitrarily imposed.) If the x-axis were to run through the horizontal centre and the y-axis ran through the vertical centre, the point of intersection of these two lines would, of course, constitute the centre of the physical universe. However, when the initial conglomerate of gas achieved fusion within the core, that initial state of fusion could have transpired anywhere in the four quadrants of the ellipse (and anywhere within one of the quadrants). Therefore, the point at which the initial state of fusion was achieved (the point from which the vortices of energy subsequently expanded away from) would be the centre of the universe as we know it (galaxies, etc.) In essence, as confusing at it may seem, there would be two points at which one could potentially state this is the centre of the universe. The

first would be the intersection of the x and y-axis. This point would be the centre of the "overall physical universe". The other centre point could potentially be the point at which the *initial* state of fusion was achieved. This would be the centre of the universe that we *observe*. Therefore, the validity of the concept that prevails in the standard big bang model (there is no point from which the expansion began) must be questioned.

If the reader is willing to entertain the concept of some kind of barrier in outer space, the next question raised would be as follows. If there is insufficient matter to halt the expansion of the universe, what is the eventual fate of the universe? Eventually, the galaxies would smash into this barrier. What would transpire at that stage? I can't even begin to suggest. To even begin answering the question, the nature of the barrier would have to be ascertained. It probably would not be comprised of any "conventional atomic material" (such as would be found in the periodic table) that we are familiar with. Since the barrier would be the end of space, it would have to be able to withstand the phenomenal energy associated with an entire galaxy smashing into it. Perhaps the cohesive galaxy would be destroyed and converted to some other type of intense energy (who knows exactly what) and propagate back into space. However, for the time being, this would all be the wildest speculation.