Reader Criticizes Chinese Science Article

In the interest of promoting continued struggle and debate over scientific and philosophical questions in the pages of the Revolutionary Worker *we are printing the following letter which was received recently in response to an article by Bian Sizu from the 1973 Chinese journal* Dialectics of Nature *titled "The Universe is the Unity of Infinity and Finiteness" (reprinted in the Dec. 18, 1981, issue of the* RW—*issue No. 135). In responding to this letter readers may wish to further study not only that article but also another article by Bian Sizu from the same Chinese journal titled "Matter is Infinitely Divisible" which was reprinted in the Sept. 18, 1981 issue (*RW *No. 122).*

To the *Revolutionary Worker*,

I read "The Universe is the Unity of Infinity and Finiteness" with great excitement and enthusiasm in last week's issue of the *Revolutionary Worker*. The whole discussion is an important contribution to dialectical materialism and the nature of our universe. However there are also in my opinion blatant and ridiculous errors in this article which if not struggled against and exposed will cut against its importance, if not in fact turn it into its opposite.

In short this article attacks the big bang theory of the universe as well as the very possibility of a finite but unbounded "universe" (by which I do not mean Universe—the universal and eternal material world—more on this later). These theories and those scientists who uphold them are labelled as completely incorrect, western, and bourgeois. Why is this so off the wall? At this point the overwhelming preponderance of scientific evidence points to an expanding universe which developed out of a primordial explosion 15 billion years ago with the main debate between religious idealists like Jastrow (see RW No.4) claiming this represents divine creation out of nothingness and basically materialist scientists (Sagan, Asimov, Weinberg, Motz) who see that this must have been formed out of the collapse of the previous cycle of the "universe". Furthermore the question of this "universe" being finite but unbounded does not flow out of the head of some demoralized scientist, but is a very plausible and I think correct interpretation of the general theory of relativity.

The evidence for the oscillating universe is so strong that even the most famous upholders of the homogeneous steady-state theory like Hoyle, were forced by the 1960's to admit that the former model is correct. To characterize this briefly—the chief evidence for an explosion approx. 15 billion years ago which led to an expanding, evolving universe include the red shift of all but the nearest galaxies, the discovery of 4K background radiation "left over" from the big bang, and quasar counts which show that galaxies were more tightly packed together billions of years ago than today. The gradual slowing of the "universe" by gravity and its eventual contraction find strong evidence in Sandage's calculation of the deceleration parameter which shows a slowing of the "universe's" expansion rate over the last billion years. Even the question of the "missing mass" required for gravitational force strong enough to cause contraction of the "universe" can be explained in several ways (the neutrino may have mass, black holes and neutron stars may be very common, etc.).

The tremendous gains made by the theory of the oscillating universe have caused a crisis in bourgeois and idealist thinking, especially in the western religious concept of inital creation as well as the rebirth of empirio-criticism and even the view that intelligent life has willed itself into existence—the Absolute Idea—(see for example a ridiculous article in the Dec. '81 *Scientific American*, "The Anthropic Principle in Cosmology").

But much more to the point these rapid advances in cosmology have been an ideological big bang which has brought a whole section of astronomers and physicists to increasingly stand against idealism and develop (objectively) in the direction of a dialectical materialist understanding of the universe including raging and profound debate over chance and causality in physics. Sakata (a Marxist physicist from Japan) pointed out in 1969 that when Lenin wrote *Materialism and Empirio-Criticism* and fought against Mach's idealism there were literally no physicists who supported a dialectical materialist point of view. "Later *nature itself* (italics added) compelled physicists to grope along the path foreseen by Engels and Lenin." Today, due especially to advances in particle physics, physicists who basically adhere to this view and who break with positivism and metaphysics have appeard on history's stage.

Part of the Cygnus loop thought to be the wavefront of a supernova explosion that took place 60,000 years ago.

Does Bian Sizu understand all of this? He offers not a particle of scientific evidence that would refute any of this and even seems to label all of this as western thinking. To me science is science and there is no such thing as western or Chinese science (in fact this smacks of Chinese nationalism to some extent). How can a dialectical materialist philosopher write this article without examining one of the three great struggles—scientific experiment? This sort of separation is itself metaphysical and profoundly wrong.

Dialectical materialism *is* a powerful weapon—Engels used it to show that matter had to be eternal and pointed toward a hierarchy of organization of matter with much less scientific evidence than now exists. Some people might be asking—but isn't there some dialectical materialist necessity to attack the big bang or a finite but unbounded "universe"? Isn't such a "universe" in blatant opposition to matter being organized into an inexhaustible hierarchy of *higher* as well as lower forms? Bian Sizu seems to think this way, but let's examine this more closely.

The whole struggle in physics is ripe with examples of advances in man's understanding around which proletarian and bourgeois outlooks struggle. In Lenin's time the discovery of radioactive decay proved that atoms are not indivisible, leading Mach and other physicists to flee into empirio-criticism. The discovery of quantum mechanics and Heisenberg's uncertainty principle led Einstein to exclaim, "I cannot believe God would play dice with the world" and others to say this proves you cannot know the world much less change it, yet this did not prove it wrong. In fact this theory is correct and has been the basis for further advances in science and philosophy. The discovery that "ether" could not exist in space as a vehicle for the propagation of light caused a crisis in both physics *and* dialectical materialism, but today only a fool would claim that there has to be ether in space to uphold materialism. In fact the destruction of the ether theory was one of the paths which led Einstein to discover the special theory of relativity—a major leap for dialectical materialism.

Do scientists today, even some of the most progressive, draw idealist conclusions from an expanding "universe" which is finite, but unbounded? Yes—especially in terms of this meaning we have reached the limit on the macroside. Sagan falls into a yin-yang spiritual view of the Universe. Asimov, in his excellent book, *The Universe—From Flat Earth to Quasar*, shows strong streaks of positivism and says the limit of how far we can observe makes anything beyond it irrelevant anyway (a sort of out of sight out of mind syndrome). Nigel Calder says about the same in his book *The Violent Universe*.

However, matter is composed of an infinite hierarchy of levels of organization as Bian Sizu himself powerfully states. Our "universe" appears to be finite, unbounded, and oscillating from all scientific investigation to date. But why should we think this "universe" is the only one of its kind? There are probably huge numbers of such "universes" within the Universe—all with roughly the same physical laws in operation and with their interconnections and development governed by natural laws yet to be discovered and which could be different than the main forces—nuclear, electromagnetic, gravitation—that govern the portion of the cosmos we are aware of. Should it surprise us that finite, unbounded "universes" constitute one level in the hierarchy of matter. Isn't the atom finite in space? Doesn't it contain an infinity of smaller subdivisions of matter? There is a fundamental unity of opposites in the positive and negative charge of the atom which exist in stable equilibrium without qualitative evolution over billions of years. Yet atoms take place in evolution on the molecular level. Also the atom is governed by quantum mechanics while the macro world is governed by the general theory of relativity in which gravity and electromagnetism seem to form a fundamental contradiction.

Unfortunately I think there is another reason why Bian Sizu would oppose this view of reality. In the section "Everything in the Universe is Continuously Developing" there are some straight line and undialectical views in my opinion. "When the earth dies out there will be even higher levels of celestial bodies to replace it. By that time people will celebrate the unity of dialectics welcoming the birth of new stars. When the human species dies out there will appear even higher level species. Speaking from this point of view, human activities are creating conditions for the appearance of even higher species." This strikes me as a form of anthropomorphism. For man to develop forward in a straight line comes into pretty sharp contradiction with a "universe" which will ultimately collapse to be "reborn" to be sure, but it doesn't seem likely that intelligent life would survive.

Mao, in a very excellent article (Talk on Sakata's Article, Mao Miscellany) makes I think a similar error in terms of straight line development. "In regard to the solar system and the earth we have not as yet overthrown Kant's nebular hypothesis that both the earth and the sun were formed by the creation of extremely hot gases. Our earth is most probably still in its youth and is growing larger steadily because many things such as meteorites and sunlight are falling on it every day."

In both these cases a straight line view is wrong. Our solar system *was* formed from dust of a star that went supernova, and once planets have formed they are fairly stable over billions of years, and perhaps our universe will oscillate for trillions of years. Yet there is development on other levels of the hierarchy of matter. Hydrogen and helium are formed in the big bang and other atoms are formed in the stellar furnaces through fusion and even more complex atoms in supernova explosions. These atoms do not evolve into endless higher atoms, but on the next (molecular) level in the hierarchy of matter these stable atoms take part in the evolution of chemical and biochemical compounds and eventually the development of intelligent life itself (see Victor Weisskophf's *Knowledge and Wonder*). Thus life develops on the surface of a stable planet over the remaining life of our sun at least. In a similar fashion why can't our oscillating universe together with many just like it take part in development and evolution on higher levels of matter as of yet undetected? Clearly this sort of development could well take place in spite of the destruction of all life in our universe billions of years from now, but that's the way reality may go.

So what is serious criticism here and what is speculation? The point is that it's not permissible to have dialectical-materialists who do not take part in the struggle to understand the scientific evidence of their time. Engels (*Dialectics of Nature*), Lenin, and Mao all fought to develop dialectical materialism in connection with struggle on the scientific front. But not every page is as bright. During the 1930's in the Soviet Union serious distortions of this stand took place. Physicists were told to avoid Einstein because relativity went against the ether theory. Also the Heisenberg uncertainty principle was declared a priori as anti-dialectical materialist. To make matters worse there appear to have been actual instances where scientists were repressed because they went against some of this. The point is that these errors could have been avoided by these "philosophers" learning from Lenin's stand, viewpoint, and method. These errors have been seized upon to make dialectical materialism appear to be some sort of a bizarre Marxist state religion forced on science. I tend to think that this has seriously impaired genuine and liberating dialectical materialism from being consciously studied by these scientists and the thousands who are following these major questions of cosmology.

I strongly suggest that as Bian Sizu's very profound article is taken out broadly in society that some sort of criticism of these shortcomings be written to accompany it. I am looking forward with great anticipation to further translations from the Shanghai Journal—*Dialectics of Nature*.

C.C.

Books upon which I have based this letter are:

The Universe—Its Beginning And End	Lloyd Motz
The Collapsing Universe	Isaac Asimov
The Universe—From Flat Earth To Quasar	Isaac Asimov
Knowledge And Wonder	Victor Weisskopf
Some Philosophical Problems Of The Theory Of Elemental Particles	Sh. Sakata
Einstein's Universe	Nigel Calder
The Violent Universe	Nigel Calder