acts, or real curvature, becomes less and less possible, even if the establishment controlling science tries to hide it or to mystify it as they do by promoting the so-called Chaos Theory, or Complex Theory. If humanity accepts malthusian policy directives, and allows the destruction of technological development, especially of the capability for space colonization, the debate in science around these fundamental issues, will become as it was in the Middle Ages, tainted with mysticism and scholasticism. If we can defeat the malthusian policies, the solution to the issues of the curvature of physical space-time, along the lines indicated, will usher in new physical discoveries and advanced forms of technologies.

This is why it is not simply a logical debate. It is a political fight to maintain the "scientific matrix" which we have called Socratic Christian. It may become clearer to you now if I paraphrase a recent article by Cardinal Joseph Ratzinger. Around the issue of intelligibility and truth, Ratzinger writes, we can establish the clear distinction between Socrates-Plato, who believed that man can know the truth in connection with the Absolute, and those (referring to the Sophists) who believed that man could create on his own, *and arbitrarily,* the criteria governing his life. And then he adds: "The fact then, that Socrates, a pagan, could become in a sense, *the prophet* of Jesus Christ . . . is based on such fundamental issues."[2]

"That, I guess should stimulate your mind a little bit," De Paoli concluded. "As I stated at the beginning: Someone's ideas were transfinite to what I have presented. It is essentially Lyndon LaRouche's creative and political action that has presently *integrated* much of the work of the past and created the possibility for their continuation."

Notes:

1. "Fragments of a Philosophical Content" in *The Collected Works of Bernhard Riemann,* New York: Dover, 1953.
2. *Il Sabato,* March 16, 1991.

Appendix: On the notion of continuity and the infinitesimal

The following comments may make clearer to some readers the fundamental issue addressed in the speech, which was an attempt to present in a simplified version the mathematical problem of continuity.

The notion of "continuity," as the Leibnizian principle of continuity or the Cantorian axiom of continuity, derives historically from the work of Eudoxus, Archimedes, Cusa, and Kepler, arriving at the modern form of the debate on the question of infinitesimals in which Cantor participated. The issue is crucial, not only epistemologically, but also as a matter of great importance in mathematics and physics.

The question may be best illustrated by considering the distinction existing between a circle and a polygon, between a line and a curve, or, better, between linear and curved action. If we do not admit the principle of continuity, the so-called Archimedean axiom, as it is called today, then essentially we rule out the possibility of ever bridging this gap. We operate only in the algebraic realm, and for that reason, we are restricted to the premise that the angle of an inscribed polygon, however many-sided it may be, will always be smaller than the circumscribed circle; and also, that the "linear side" of the polygon, no matter how many times we divide it, will never become "zero" or really curved; that is, we have a non-Archimedean geometry, as it is called.

The transcendental numbers, and the concept of the transfinite more generally, establish precisely the common denominator for bridging the gap between these "two natures." Cantor's attack on the notion of infinitesimals is correct in this sense. But we must be careful not to confuse the term "infinitesimals," as it is employed in the 19th and 20th century, deriving from Cauchy (or the way Veronese used it), with Leibniz's terminology. In the modern, Cauchy version, the manifold in which the infinitesimal operates is reduced such that the impossibility of reaching the limit is built in from the start: we have the polygons, and we have the circle, and never can the two be brought together. Nor is Euler's approach, which demands an infinitely divisible manifold, any alternative.

In reality the alternative is precisely what Cantor had proved: The only meaningful notion of infinitesimals is found in the transfinite numbers. Thus, differentiation and integration are one common operation, a mirror image of transfinite action—that is the *mixton* in Plato, or the second principle of construction in Cantor. Cantor declares explicitly that he is able to find a "common measure" for continuity and discontinuity (*Cantor Werke,* p. 152). It must be emphasized that the continuum is not an object, it can be meaningfully understood only as the unity of the three principles of constructions. That, and only that, can bridge the "two natures" (as Cusa would have put it). The continuum is self-similiar but of different types of ordinals. By definition it creates segmentations or quantization, and thus cannot be reduced to a dichotomy between simple continuity and simple discontinuity.

—Dino de Paoli