When One Plus One Equals Three: Evidence, Logic, and Professional Discourse

Douglas Gerwin

Paul Dirac, the twentieth-century mathematician known for his acerbic brevity, is said to have sent the following cable to his colleagues following the birth of his first daughter: "1 + 1 = 3."

In the context of conventional mathematics, this equation is incorrect; from the perspective of married life, however, it may constitute a true statement, assuming that Dirac and his wife did indeed bring a new member into their family. It all hinges on what you allow by the term "plus:" Does it mean simply the *combination* of previously existing entities, or can it also represent the transformational *union* of two entities into something greater than either one of them?

This was the kind of question that hung in the air of two conferences I attended during Easter Week earlier this year. Though separated by six thousand miles and nine time zones, these two gatherings both adumbrated the same nagging question: When it comes to researching the nature of the human being, what are we willing to accept as evidence—along with all of the assumptions that make that evidence meaningful—and what are we unwilling to accept? Put differently, when, if at all, is the human being simply an additive collection of traits, and when, if at all, is it a being capable of transforming itself into something greater than itself?

The first gathering, held on the eve of the annual conference of the American Educational Research Association (AERA) in San Diego, California, brought together a small but broad spectrum of researchers and educators from North American universities and Waldorf institutes; the second, held a few days later at the Goetheanum in Dornach, Switzerland, included invited empirical researchers and Waldorf educators from the fields of biology, pedagogy, and curative education.

There can be no progress on this question of legitimate evidence without at least a measure of agreement on what constitutes a human being. Take, for instance, the question of stages of human development. At the San Diego gathering, participants representing Waldorf education came with the assumption that the human being undergoes predictable stages of development for which different approaches to education are appropriate, indeed necessary. This assumption was not shared by participants from other educational streams, for whom questions of developmentally appropriate modes of teaching did not figure in their research nor in their suggestions for educational reform. And while they respected the idea of developmental stages in planning curricula, they did not seem interested in exploring it for their own proposed reforms. The conversations were stimulating, personable, and genial, and yet I had the sense we were talking past, rather than with, one another. To put it concretely: If rock music is perceived to be developmentally inappropriate at a certain age, for example, we will not include it in the curriculum. If stages of development are not recognized, however, there is no reason to exclude catchy rock tunes from the classroom, especially if they help to capture the attention of restless youngsters. Bracket the existence of developmental stages, as understood by Waldorf educators, and the exclusion of rock music from the classroom may be perceived as quaintly old fashioned, even overly protective.

Skewed Justifications

A similar, though more nuanced, feeling of skewed discourse pervaded the gathering of some 150 participants at the Goetheanum, who were jointly invited by Michaela Glöckler, leader of the Medical Section of the Anthroposophical Society, and Christof Wiechert, leader of its Pedagogical Section. Their stated intention was to provide a forum in which researchers from a multitude of backgrounds could converse and seek common ground.

As a representative of Waldorf education, it was a wake-up call to hear that modern empirical science can quite legitimately be seen to support the practices of Waldorf education, on the one hand, while at the same time to be told that this evidence should in no way be used as the basis for making pedagogical decisions about appropriate curriculum for any one age group.

This caution deserves to be heard among Waldorf school circles in which statistical results of experiments conducted in mainstream science are used to justify certain practices—or their absence—in Waldorf school classrooms. Heiner Ullrich, Professor of Education at the Johannes-Gutenberg University in Mainz, Germany, who devoted his doctoral dissertation to Waldorf education, argued forcefully that pedagogical principles are built upon what *ought* to be among children, not only on what is their situation in the present case. He pointed out that teachers need to shape their lessons not only according to how their children are but according to how they *should* develop. If they appear too ruddy in their cheeks, for instance, we may balance their disposition with exercises in memory; if they grow too pale, we introduce exercises that stimulate imagination. These exercises are introduced because we feel the children should be helped to achieve a condition of healthy balance.

The results of empirical research into the development of children, however, are intended to indicate solely what is—or may be—the case in one or another set of circumstances. These empirical results are never intended to tell teachers what to do. "A statement of what is can never be used to derive a statement of what ought to be," Ullrich concluded. "Logically, an *ought* statement can never give rise to an *is* statement."

In practical terms, this serves as warning against using the results of contemporary science, such as brain research, to justify the practices of Waldorf education. While it may be useful, even reassuring, to know that the results of mainstream empirical research are consistent with the practices of Waldorf education, it is a logical fallacy—and even a disservice to this empirical research—to wrench it into the witness stand and use it as testimony in favor of Waldorf educational practices. Contemporary research may serve to confirm, or challenge, what we do, but it cannot be appropriated in order to instruct us what to do. For pedagogical reform we need to exercise pedagogical insight, rather than rely upon empirical results.

Ullrich was one of several university professors at the Dornach conference who, based in their empirical research, offered fresh insights into the nature of childhood. But they vigorously resisted the suggestion, advanced by Christof Wiechert, that they might be illustrating certain archetypal principles that underlie the unfolding of the human being. For Ullrich, childhood is "an historical phenomenon, not a universal reality." In his view, children are children by dint of what we make of them in a cultural and historical context, and not spiritual entities going through archetypal stages of development.

Professor Hans Georg Schlack, chief physician at the Children's Neurological Center in Bonn, Germany, and a specialist in neuro-pediatrics, took a similar view in his summary of empirical research concerning the ability of young children first to recognize their reflection, second to refer to themselves by their own name, and, finally, to name themselves using the first person pronoun. He related that researchers studied the first step by painting a red dot on the forehead of an infant and then holding it in front of a mirror. To begin with, the toddlers would attempt to touch the red dot by reaching for the mirror surface; eventually they would touch the dot by tapping their own forehead. Schlack pointed out that most children made this switch over roughly a one-year period––between the ages of 12 and 26 months. By contrast, most children began to refer to themselves by their own name over a much longer period of 2.3 years—between the ages of 14 and 42 months. And the final achievement, of referring to oneself as "I," took most children an ever longer span of 2.5 years—between the ages of 24 and 54 months.

His point was to stress the wide range of variability in the timing of these stages, and he categorically rejected the notion of any narrowly defined "normal" or archetypal timetable. He was unwilling to be drawn into speculation as to why the first period was so much shorter than the second and third periods.

From an anthroposophical perspective of the human being, however, it was striking to notice that the more that a change was tied to the physical body (i.e., learning to touch a red dot on one's forehead), the shorter the time frame of development, and, conversely, the more a change was independent of the physical body (i.e., referring to oneself as "I"), the longer the span of development.

Evidence and Logic

Perhaps the most striking example of the difference between mainstream and anthroposophical research was offered by Wolfgang Schad, a Waldorf school graduate and high school teacher who also taught biology of evolution and morphology at the University of Witten/Herdecke, Germany. He painted a remarkable picture of the human placenta as a physiological representation of the higher self that accompanies the human being as it takes hold of a physical body.[1] He described how the placenta initially performs all of the physiological functions on behalf of the growing embryo, and only gradually relinquishes these functions as the fetus becomes capable of taking them on itself. Basic functions, such as respiration, circulation, digestion, and excretion, are slowly handed over to the fetus as it develops. One can say that the placenta "dies away" as the embryo emerges, so that the birth of the embryo at nine months coincides with the death of the placenta. "In short," Schad concluded, "one can think of the placenta as the best kind of Waldorf teacher, one who gradually steps back while handing over the functions of existence to the child as it is able to take them on, until the child is launched in full freedom, no longer bound by any umbilical attachment to the organism that gave it help for as long as it needed it."

How are we to interpret the evidence of human development if we cannot come to a shared picture of what a human being is, including its higher nature? A view of the human being that excludes any spiritually guided stages of unfolding will make no sense of Schad's research beyond its basic empirical data.

In an essay published some years ago,[2] Schad offers three levels of interpretation when it comes to studying the full human being, using three distinct modes of thinking or sets of logical assumptions. At the most physical level, he says, we can understand the human body in terms of the laws of the physical world, which we also know as laws of causality. Here events of the past give rise to—and often fully explain—events of the present. Thus, given two billiard balls, A and B, one can fully explain, even predict, the motion of billiard ball B once it is hit by billiard ball A; in this instance, the present is explained by the past. Cause explains effect.

Once we rise to the level of the living physical body—that is, a physical entity given life by an etheric organism—the rules change. However we try, we will be hard-pressed to explain present behavior fully in terms of past events. Here Schad introduces a new way of thinking, which he calls "biological thinking," in which we let go of the model of the past determining the present and speak only in terms of one present event coinciding with another present event, without making any claim as to one being the cause of the other. We thereby escape the conundrum that causal thinking poses of the living realm: Which comes first, for example, the chicken or egg? Instead, we restrict ourselves to observing the close relationship between chickens and eggs. In causal thinking, we can say, "If this, then that"; in biological thinking, we say "When this, then that."

Finally, we rise to the level of the sentient living physical body—that is, a living physical organism inhabited, at least for as long as we are awake, by a conscious soul or astral body—and Schad describes how the rules of explanation change once again. At this level we make more sense of present events by attending to the soul's desires or wishes; in other words, we make sense of present events not by appeal to some abstract cause in the past, but, rather, by attending to the nature of some as yet unrealized future. At this level, paradoxical though it may sound, the present is shaped more by the future than by the past. Schad describes this approach to understanding the human being at the soul level as "teleological thinking," in which explanation is couched not in terms of a past cause but of a future goal (Greek: *telos*). At the level of the soul, we understand the human being more fully by seeing how the future gives shape to the present.

In this way, Schad points to three distinct levels of understanding when it comes to the study of human nature. Evidence couched in terms of causality may adequately account for events at

the level of the physical body but prove to be incapable of making sense of the human being in its living and conscious aspects. For these levels we need other forms of evidence, and other ways of thinking about this evidence.[3]

Herein lies a two-fold task. The first is to determine which kind of evidence we are considering and with which type of thinking it is best understood. When does 1 + 1 = 2, and when not? The second is to articulate as clearly as possible the logic—causal, coincident, or teleological—by which we are assessing this evidence so that we can more successfully reach out to other researchers at the level at which they are conducting their work.

Endnotes

1. This research forms part of a new publication, which we hope to excerpt in translation in a forthcoming issue of the *Research Bulletin*.
2. See Wolfgang Schad, "Scientific Thinking as an Approach to the Etheric," in *Toward a Phenomenology of the Etheric World*, ed. Jochen Bockemühl, Spring Valley, NY: Anthroposophic Press, 1985, pp. 163–197.
3. E.F. Schumacher, in a succinct little volume entitled *A Guide for the Perplexed* (London: Jonathan Cape, 1977), develops this idea in a similar way, describing what he calls four levels of adaequatio. The highest of these four levels is reserved for an understanding of the human "I," or that aspect of the human being that is not only sentient or conscious, but self-conscious.