

WISDOM FROM JUAN CARLOS CACHANOSKY ON ECONOMICS SCIENCE VS. MATHEMATICAL ECONOMICS

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I attended Grove City College from 1979-1983, where I studied under Dr. Hans Sennholz. His teachings instilled in me a passion for economic reasoning, the power of the market mechanism to generate wealth and prosperity, and the vital importance of the classical liberal political and legal order that gives space and protection to the individual and commercial activity. I was not an immediate "convert" to Dr. Sennholz's way of thinking, but it was pretty quick and it motivated me to read, think, and explore more and more about these ideas, not only the class materials but the books that developed those ideas, and the thinkers behind them, from Adam Smith to Ludwig von Mises. A unique aspect of the Sennholz-led economics department at Grove City was that we were required to take a year-long course in history of economic thought, as well as courses in symbolic logic and other forms of deductive reasoning. I had also contemplated switching majors at one point to mechanical engineering under the suggestion of my father, so I had taken calculus early on in my education at Grove City. Though I did demonstrate certain academic aptitudes, among them being math and geometry, I wasn't much of a student in high school because my interests were directed elsewhere, namely my athletic pursuits. However, Dr. Sennholz's lectures and my growing interest in economics won out. I can remember the puzzled look on my father's face as his son, who headed off to college only wanting to become a high school basketball coach, had then considered briefly preparing for a career in business and mechanical engineering for financial security reasons. Then told him, 'you know Dad, I think I want to study economics and philosophy'. To my father's credit, he did not discourage me in the least.

Another unique feature of Dr. Sennholz's Economics Department at Grove City College was that it was small -- 4 members -- located in a small college, and there were very limited publication requirements for the faculty. But, Dr. Sennholz had a list of publications longer than the entire course catalogue at the college. His books were on display at the bookstore, and his articles circulated among the students. Sennholz wrote for a wider audience than his scientific peers, so his articles were readable and for the most part practically oriented. But they also stood fast in their principled stance. We all knew that Dr. Sennholz traveled around the country and the world giving public lectures and sharing his knowledge with students and interested non-academics. This led to two additional unique features of Grove City College economic community. First, Dr. Sennholz was a member of the faculty of the International College (California) which offered graduate degrees. As a result, there were several graduate students working under Sennholz's mentorship during my time at Grove City, including graduate students from Argentina, France, Guatemala, etc. Second, because of the presence of graduate students earning MA and PhD degrees, despite the fact that Grove City College was a small liberal arts college, there was a weekly research seminar in economics.

As my interest in economics grew during my studies and I sought out opportunities to learn more through organizations such as the Foundation for Economic Education and the Institute for Humane Studies, Sennholz acknowledged my interest. He was puzzled because I was also a college athlete, and I was an active campus leader in the Greek culture of fraternities and sororities. In my junior year, I was the only undergraduate invited to join the weekly Wednesday evening research seminar. When he asked me to join, he had only 2 conditions: (1) I must keep up with all the readings and be ready to seriously contribute, and (2) I must wear a proper pair of trousers and dress appropriately and not in my warmups and sweatshirts. If I failed to comply, he told me bluntly, "we will kick you out." I excitedly agreed to the challenging opportunity, and I went every Wednesday night starting in January 1982, with a pair of khaki pants and an oxford button down shirt that I went out and bought during winter break, and in-between I would spend as much free time as I had in the library reading whatever economic works we were expected to have read for the upcoming discussion. For the next year and

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a half of school (I graduated in May 1983), I pretty much sat and listened at the seminar as the intense conversations took place among people who had read more, and knew far more economics, philosophy, politics and history than I did, and took notes and thought about the material. I also decided I want to be able to contribute to that conversation someday, and thus that I was going to have to go to graduate school myself to learn more and master this material.

It was in that graduate seminar that some of the graduate students brought me back my copy of Menger's *Principles* from their visit to Laissez Faire Books; it was in that seminar that I read all of Bohm-Bawerk's *Capital & Interest*; it was in that seminar that I wrote and presented my first paper in methodology discussing the linkages between Max Weber and Ludwig von Mises. It is hard for me to recreate in my mind what that experience meant for me and my subsequent development, but I am almost certain without that experience I never would have thought graduate school in economics let alone a career as a teacher/scholar was what I wanted to do. Even with that, it took me a year after I graduated to take that leap to attend graduate school at George Mason University, and I took it precisely because that experience Dr. Sennholz provided for me hooked me in a way that I didn't even realize at the time.

One of the most memorable events during my time with the group of graduate students studying with Dr. Sennholz was attending their PhD dissertation defenses. The first one I ever attended, however, was the most memorable -- and that was Dr. Juan Carlos Cachanosky's thesis that is currently being made available. Re-reading it today, I am reminded of two factors that were burned in my memory. The force of argument in Dr. Cachanosky's thesis, and the carefulness with which he critically engages those who he disagrees with. As a student of Sennholz, of course, I had read the criticism of mathematical economics one reads in Mises and Murray Rothbard. Many of which I still agree with to this day. But I can remember trying to follow Dr. Cachanosky's presentation of the arguments from Paul Samuelson, and those who came before him such Cournot and Walras, and those after such as Koopmans and Arrow. I didn't know all those figures then, but I remember being impressed by the command of the literature reflected in the presentation. Re-reading his presentation only confirms that memory. In addition, Dr. Cachanosky did not rely merely on the restatement of the Mises-Rothbard critique to do the work for him, he critically engaged this mathematical economics literature to a large extent on its own terms. This side of his argument I see in retrospect perhaps had a bigger impact on me than I could have recognized at that time. It has become a significant part of my own self-understanding of modern economic thought to stress the distinction between logical soundness and logical validity, as well as the more traditional Austrian distinction between market processes and equilibrium end states.

The bottom line is that modern economists under the simple observation that a lot of disputes in economics seemed to defy resolution thought they could bring precision to the discipline and resolution through the adoption of mathematical reasoning. Confusion results when the same words are used to mean different things, or different words are used to mean the same thing, so if through formal mathematical reasoning we can eliminate this confusion than progress could be made. The price of this, however, was a subtle shift from a quest for logical soundness to logical validity. Mathematical reasoning can ensure syntactic clarity, but it does not guarantee semantic clarity. The cost, one might argue, for gaining precision, is the loss of understanding of purposeful human action and the complexity of social cooperation under the division of labor. Rothbard's critique of continuous functions, and the violation of Occam's Razor entailed in trying to get straight the relationship between syntactic and semantic clarity, are basically right, but can be seen in a new light once we focus on this trade-off between tractability and precision, and intelligibility and understanding.

During the defense, one of Dr. Cachanosky's inquisitors asked him what would substitute for mathematical reasoning in this economic "science" as he envisioned it. His response rings in my ears 40 years and counting later -- *deductive logic*. The verbal chains of argument entailed in critical reasoning are what constitutes economic theory from the classical political economists to the great practitioners of political economy in the 20th century such as F. A. Hayek. The mathematical method, and the tools utilized such as the simultaneous system of equations in a Walrasian model are *by construction* unable to illuminate the processes that we seek to understand that are responsible for the order of the market system.

Hayek in his famous essay "The Use of Knowledge in Society" described the market system as a "marvel" and he argued that he had used that word -- marvel -- precisely to shock his readers out of their complacency. The modern representations of the market in general competitive equilibrium theory had blinded economic theorists to the messy but marvelous beautify of the coordinating properties of Adam Smith's 'higgling and bargaining' in the market. Price theory, and its focus on relative price adjustments, and the adaptation to change

by human actors on multiple margins guided by prices, and lured by profit and disciplined by loss, is simply glossed over in the Arrow-Hahn-Debreu world of general competitive equilibrium. The mathematical model and techniques are not up to the task asked of them in the theory of the market *process*, and the science of economics suffers as a result of their wide-scale adoption.

Cachanosky's argument echoes that of another of my George Mason University graduate school professors a few years after I left Grove City College -- Kenneth Boulding. Boulding is the 2nd John Bates Clark Medal winner from the American Economic Association after Paul Samuelson was the first, Milton Friedman would win the 3rd one. Anyway, Boulding was the only one among the early winners to not win the Nobel Prize, and one might surmise that this was because his research direction was decidedly different than where economics went in the subsequent decades with the rise of mathematical economics. Boulding who was a skilled mathematician himself, actually recognized the limitations of formalism in discussing the play between human agency and social structures. As he argued in his wonderful review essay of Samuelson's *Foundations*:

The mathematicians themselves set up standards of generality and elegance in their expositions which are a serious bar to understanding. Conventions of generality and mathematical elegance may be just as much barriers to the attainment and diffusion of knowledge as may contentment with particularity and literary vagueness. ... It may well be that the slovenly literary borderland between economics and sociology will be the most fruitful building ground during the years to come and that mathematical economics will remain too flawless in its perfection to be very fruitful.¹

The subsequent years, I would argue have proven Boulding correct. All the modern developments in political economy, such as property rights economics, law-and-economics, public choice economics, and market process economics, in their creative and innovative period defied formalistic presentation. They proved more scientifically fruitful than the mathematical economics that had to assume those subtleties away for tractability.

Read this dissertation of Juan Carlos Cachanosky's on economic science versus mathematical economics. Remember it was written in the late 1970s and early 1980s, and it has as much relevance I'd argue to our ongoing conversation in economics today as it did then, perhaps even more so because it wasn't a message heeded at that time. The "deformation" of our profession has continued unabated in the subsequent decades, and the farther removed economic students are from learning about the more realistic presentations of the subtle and nuanced processes of human economic activity found in the classical political economy of Smith, or the early neoclassical economics of Marshall or Wicksteed, let alone the Austrian economics of Menger, Bohm-Bawerk, Mises, Hayek and Kirzner. This error is science, this error in education, and this error in application must all come to an end. It is refreshing that this dissertation will now see the light of day in English translation. I hope it will inspire a new generation of serious economic students to put on their thinking caps, pick up their pens, and work to eradicate the errors that permeate the discipline of economics. And, when they are pressed as to what will ensure the veracity of their arguments they can follow the lead of Juan Carlos Cachanosky and respond simply that *deductive logic* and the rules of critical reasoning are what must guide the economic theorists efforts, and not the false promises of flawless precision of imaginary worlds that can deliver logical validity but not logically sound economic theory.

¹ See Kenneth Boulding, "The Role of Mathematics in Economics," *JPE*, 56 (3) 1948: 199