

**SUMMARY**

At about 16, when starting to take life seriously, I fell in love at once with philosophy and science – in that order – and have attempted to intensify their interaction ever since. As I put it in my inaugural lecture as the professor of philosophy of science at Buenos Aires University (Bunge 1957a), I have tried to philosophize scientifically, and approach science philosophically. The philosophical approach to science led me to recast some scientific theories in the axiomatic format, which forces one to focus on the most important concepts and propositions of a field of study, as well as to detect possible sources of trouble. Axiomatize to understand and philosophize to do sound and useful axiomatics. And the scientific approach to philosophical problems has led me to look for both motivation and support in the science of the day. No *philosophia perennis* for me.

I have criticized views that seemed to me to be utterly wrong, like subjectivism, or harmful, like intuitionism. But I have also attempted to polish nuggets, such as realism, materialism, systemism, and humanism, and turn them from isolated opinions into precise and well-grounded systems (theories). I have also been a militant philosopher rather than a dispassionate commentator, because I believe that philosophy can be beneficial or harmful, and that even apparently neutral and harmless *jeux d'esprit*, such as games in linguistic analysis, are harmful in diverting attention from burning issues. Even dangerous charlatans like Hegel and Nietzsche deserve more attention than Wittgenstein and his followers, because the former tackled, albeit wrongly, some important issues, whereas the latter only played with words. Important errors are worth more than frivolous puzzles or high-sounding nonsense. For example, Henri Bergson's intuitionism was wrong, but he grappled with important problems, wrote clearly, and was honest. These features of his

philosophy explain why he was so popular in his time, and why Bertrand Russell paid such close attention to Bergson, whereas he did not waste time criticizing Edmund Husserl and his ilk.

I was lucky not to have had philosophical mentors. This has caused me to waste much time both reinventing the umbrella and hacking my trail independently. To be sure, this path has been in zigzag, but it led me to fashioning a philosophy that I hope is close to the science of the day, as deep and exact as I could manage, and a system rather than a pile of disparate opinions. My philosophy is a system, in that its various constituents support one another. For instance, my ontology is materialist because my epistemology is realist; and my political philosophy is socialist in the broad sense (as integral democracy) because it is supported by a humanist ethics, as well as protected from utopianism by its scientism. A philosophy without ontology is invertebrate, it is acephalous without epistemology, confused without semantics, and limbless without practical philosophy. Because it is systemic, my philosophy can help cultivate all the fields of knowledge and action, as well as propose constructive and plausible alternatives in all scientific controversies.

I believe that my main contribution to physics has been my book *Foundations of Physics* (Bunge 1967), which had a strong philosophical motivation. This was my attempt to prove, not just state, that the quantum and relativistic theories are realistic (observer-free), and that their subjectivistic (observer-centered) interpretations are illegitimate philosophical grafts.

Most of the problems that book tackled are still being discussed, often vehemently. My thesis that the typical referent of the quantum theory is *sui generis*, and therefore deserves a new name, *quanton*, is currently under debate among the physics teachers of the upper level of the French high schools. In addition, the mathematical formalisms in that book have been updated by Guillermo Covarrubias, and independently by Héctor Vucetich and his students, particularly Gustavo Romero, both of whom have been teaching courses on exact philosophy while continuing to produce original scientific papers.

As for my philosophical work since about 1950, its main traits have been the following:

- 1/ Strong and broad curiosity, but avoidance of dilettantism.
- 2/ Interest in big unified pictures, and rather than in disparate minutiae.
- 3/ Adherence to rationality, realism, materialism, and systemism, but disinterest in miniproblems, disdain for potboilers and pseudoproblems, and denunciation of pseudoscience.
- 4/ Search for truth and fairness.
- 5/ Concern for exactness but disinterest in computation – hence in computers as well.
- 6/ Crediting the sources, and asking for expert opinion.
- 7/ Trying to keep up to date about basic science, by skimming *Nature*, *Science*, and *American Sociological Review*.
- 8/ Ignoring most of the stones in my path: plagiarists, ignorant referees, malicious critics, and university administrators disinterested in academic excellence.
- 9/ Commitment to public-interest organizations, particularly learned societies, but disinterest in holding purely administrative offices, such as departmental chairs.
- 10/ Respect for legitimate authority, and contempt for intellectual mercenaries.

I believe that my main philosophical contributions have been to the following branches:

- 1/ Erotetics or the logic, semantics, and methodology of problems: analysis of a problem into presupposition, statement, analysis, and evaluation; distinction between direct and inverse problems, and tentative solution of the latter by transforming them into bundles of direct problems.
- 2/ Semantics, or the study of meaning and truth: original theories of reference or denotation, sense or connotation, representation, and the correspondence theory of partial truth. I argue for the use of the latter in all fields except mathematics, which I

regard as the science of fictions. I also argue for exactness (conceptual precision) in all fields.

3/ Ontology or metaphysics: the general theories of things, systems, properties, events, and processes – in particular the philosophies of mind, such as mind-body dualism and neurosociological monism. My ontology may be called science-oriented *systemic materialism*. The only objects that stay outside this ontology are fictions, such as the mathematical and theological objects, the entities and occurrences of fantastic literature and science fiction, and the idealizations built at the start of a research project.

4/ Epistemology, or the analytical and the normative views of inquiry and its fruits, in particular the philosophy of the sciences and technologies– natural, social, and biosocial. My epistemology may be called *scientific realism*, both in that it assumes the independent and prior existence of nature, and in that it shuns the fictions of idealists, empiricists, and pragmatists – such as theories without an empirical support, and measurements without theories and indicators.

5/ Axiology – or value theory – and praxiology, or the study of both individual and collective action. My axiology and praxiology are realistic, and they support both the legitimate aspirations of the individual and just social regimes – those where duties balance rights.

6/ Ethics, or the evaluation of plans, decisions, and actions affecting other individuals as well as social systems, from couples to the international community. I call *agathonism*, or *egotuism*, my own ethics, for its supreme principle is *Enjoy life and help others live*. Such enjoyment is usually a by-product of higher purposes: it seldom derives from the hedonistic pursuit of happiness. And altruism comes together with participation.

7) Technophilosophy, or the philosophical study of the various technologies, or arts of designing artifacts, from engineering to management science. I emphasize both the peculiarities and the commonalities of both fields, and point out the moral neutrality of basic science in contrast to the moral commitment of technology.

8/ Legal philosophy, or the analysis and evaluation of natural law, legal positivism, and legal realism in the light of the rights of man, social justice, and efficiency.

9/ Political philosophy, in particular the analysis of the main political ideologies and their relation to both politics and the design of integral democracy – a utopian but realizable regime characterized by solidarity, participation, cooperation, and self-management.

10/ Metaphilosophy, or the philosophy of philosophy, in particular the evaluation of philosophical doctrines according to their contribution – positive, null, or negative – to the advancement of knowledge and the quality of life.

My work has been appreciated more outside of philosophy than within it. It has been valued by a number of scientists both natural and social, such as the mathematical physicists; the chemist Máximo García-Sucre, the biochemist Melvin Calvin, and the pharmacologist A. Claudio Cuello; the biologists Osvaldo Reig, John Maynard Smith and Nicolás Unsain, the neuroscientists Vernon Mountscastle and Rodolfo Llinás; the *psychologists* Dalbir Bindra, Donald Hebb, Facundo Manes, Viktor Sarris, Raúl Serroni-Copello and Endel Tulving; the sociologists Raymond Boudon, Heinz Droste, Gino Germani, Robert Merton, and Charles Tilly; the historians of science Valentin Boss and Dominique Raynaud, the criminologist Per-Olov Wikström, and the jurist Antonio Martino.

In the course of my lifelong love affair with both science and philosophy, I have been fortunate to be mentored by the restless yet dedicated physicist Guido Beck, and to exchange ideas with questioning *physicists* such as David Axelrod, Peter Bergmann, María Esther Burgos, Marcello Cini, Siegfried Flügge, Enrique Gaviola, Richard Hall, Peter Havas, Helmut Hönl, Werner Heisenberg, David Hestenes, Teófilo Isnardi, Andrés Kálnay, Willis Lamb, Jean-Marc Lévy-Leblond, Andrea Levialdi, José Leite Lopes, Henry Margenau, Michel Paty, Rafael Pérez-Pascual, Luis de la Peña, Ilya Prigogine, Gustavo Romero, Ralph Schiller, Kurt Sitte, JeanPierre Vigier, Héctor Vucetich, and John A. Wheeler; *biologists* such as Georg von Békésy, Lina Bettucci, Francis Crick, Pierre Deleporte, Guillermo Denegri, Kari Lagerpetz, Richard Lewontin, Rodolfo Llinás, Michael Mackey, Martin Mahner, Vernon

Mountcastle, Marcel Roche, and John Maynard Smith; *ecologists* such as Rafael González del Solar, Javier López de Casenave, Luis Marone, Jorge Rabinovich, and René Zayan; *paleontologists* such as Bob Carroll, Stephen Jay Gould, Eustoquio Molina, Osvaldo A. Reig, and George Gaylord Simpson; *psychologists* such as James Alcock, Rubén Ardila, Antonio Battro, Dalbir Bindra, Silvia Bunge, Juan Delius, Donald Hebb, Meinrad Perrez, Peter Milner, Pierre Moessinger, Ignacio Morgado Bernal, Jean Piaget, Ernst Pöppel, Viktor Sarris, and Raúl Serroni-Copello; *linguists* like Mike Dillinger, James Foley, Myrna Gopnik, Marcos Morínigo, and Michel Paradis; *social scientists* such as Rick Adams, Larissa Adler, Tom Asimakopoulos, Alfons Barceló, Raymond Boudon, Michael Brecher, Gino Germani, Marvin Harris, Jacques Herman, Peter Hoffmann, Irving Louis Horowitz, Robert K. Merton, Carles Muntaner, Jorge Niosi, Andreas Pickel, Raúl Prebisch, Nicolás Sánchez-Albornoz, Bruce Trigger, Axel van den Berg, and Per-Olov Wikström; *mathematicians* such as my wife Marta, Mischa Cotlar, Alberto González Domínguez, Adalberto García Máñez, Richard Hall, Hao Wang, William Hartnett, Jim Lambek, Beppo Levi, José Luis Massera, Julio Rey Pastor, Manuel Sadosky, Arturo Sangalli, and Eduardo Zarantonello; *logicians* like Paul Bernays, Mara Manzano, Jesús Mosterín, Gerold Stahl, Alfred Tarski, and Van Quine; *philosophers* such as Joseph Agassi, Evandro Agazzi, Peter Caws, Lucio Chiaraviglio, Ian Jarvie, Paul Kurtz, Lucas Lavado, Hugues Leblanc, Werner Leinfellner, Michael Matthews, Mario H. Otero, Chaim Perelman, Karl R. Popper, Miguel Angel Quintanilla, Nick Rescher, Bill Reese, Fernando Salmerón, Adam Schaff, Tom Settle, David Sobrevilla, Pat Suppes, Håkan Törnebohm, Roberto Torretti, Laurent-Michel Vacher, and Paul Weingartner; *political and legal philosophers* such as Carlos E. Alchourrón, José Juan Bruera, Ernesto Garzón Valdés, Antonio Colomer Viadel, Antonio Martino, and Ilmar Tammelo; *historians of ideas* like José Babini, Armand Beaulieu, Józef Bocheński, Valentin Boss, Stephen Brush, Carmen Dragonetti, Antoni Domenech, Raymond Klibansky, Aldo Mieli, Michel Paty, Félix Schwartzmann, William Shea, and Clifford Truesdell; *physicians* such as Bernard Dubrovsky, Daniel Flichtentrei, Enrique Mathov, Víctor Javier Sanz-Larrínaga, and Emilio Troise; *technologists* such as George Bugliarello,

Virgilio Di Pelino, Henry Mintzberg, Horacio Reggini, and Jorge Sabato; and *stage magicians* like James Randi.

I have also been fortunate in that my work has been expanded or updated by David Blitz, Guillermo Covarrubias, Heinz Droste, Máximo García-Sucre, Andrés J. Kálnay, Martin Mahner, Jean-Pierre Marquis, José-Luis Pardos-Pérez, Andreas Pickel, Miguel A. Quintanilla, Gustavo E. Romero, Dan A. Seni, Héctor Vucetich, and Poe Wang. I am indebted to my former assistants Julio Colacilli, Robert Blohm, and Mike Dillinger, my former students Moish Bronet and Michael Kary, the departmental secretaries Mylissa Falkner and Angela Fotopoulos, the publishers Gonzalo Alvarez, Lucy Fleet, Irving Louis Horowitz, Víctor Landman, Ties Nijssen, Anton Reidel, Gloria Rodríguez, Gregorio Schwarz, Serafín Senosiain, and Marc Silberstein, as well as to my copy-editor John St James.

In sum, I have tried to spot and remove some philosophical obstacles to the understanding and advancement of knowledge, as well as to sketch a pro-science philosophy useful in grappling with important new problems. A handful of thinkers with different backgrounds are currently revising and expanding my legacy – as befits an ongoing research project, in contradistinction to a sect.

If I might be excused one final immodest remark, but it is a recognition I value: Bertrand Russell and I are the only philosophers in the Science Hall of Fame kept by the American Association for the Advancement of Science. This is the pantheon of the most famous scientists of the past 200 years, and it places me between Richard Feynman and Theodosius Dobzhansky – which may only show the mismatch between fame and merit.