

Mario Bunge (2016) *Between Two Worlds: Memoirs of a Philosopher-Scientist*. Springer, Dordrecht. ISBN 978-3-319-29250-2, 496pp + xviii, EUR100

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These 500-page *Memoirs* are a delightful and richly informative read, not just about the life of Bunge, but about much of 20th century philosophy of science. The *Memoirs* will be of special interest to Latin American scholars as although the 'Two Worlds' in the title signify the two disciplinary worlds of philosophy and science, they could also signify the worlds of Anglo-American and Latin American philosophy. It is noteworthy, and says a great deal about Bunge's life, that the book's Name Index contains approximately 1,200 entries. And overwhelmingly these are of people Bunge has met during his long life. That a memoir is able to mention such a large number of people that an author has met is remarkable enough, but more remarkable is that for nearly every person mentioned, Bunge makes comment on their scientific, philosophical, or sometimes political, views. This makes the *Memoir* a philosophical commentary on issues and individuals stretching over almost one century. Thus, it is so much more interesting to read, and of much more educative value, than a commentary-free recounting of his life and encounters. Thankfully each chapter has between 15-25 subheadings which greatly assist reading, and keeping clear the time-line of the narrative.

Because *Science & Education* journal has an explicit educational purpose, and because so few educators are familiar with Bunge's writings, this review will make maximum use of Bunge's own text. As editor of the journal, I had the good fortune to be able to oversee three thematic issues on Bunge's work: 'Science Education and Religion' (Vol.5 No.2, 1996), 'Philosophy and Quantum Theory' (Vol.12, Nos.5-6, 3003), 'The Possibility of Systematic Philosophy' (Vol.21, No.10, 2012). Additionally, the journal published a Bunge article 'Energy: Between Physics and Metaphysics' (Bunge 2000a) in which he writes:

New Age scribblers have no monopoly on nonsense about energy. Careless physicists have produced much such nonsense. In fact, energy is often confused with radiation, and matter with mass. [Bunge, M., 2000a, 'Energy: Between Physics and Metaphysics', *Science & Education* 9(5), 457-461]

He then discussed a list of conceptual mistakes concerning energy found in university physics textbooks. The list would have been far longer had he bothered to look at high school texts, or elementary school texts which are supposedly informing children about energy. (A special issue of *Science & Education*, edited by Fabio Bevilacqua, was subsequently published titled 'Historical, Philosophical and Education Dimensions of Energy' Vol.23 No.6, 2014).

It needs be noted that even with 1,200 entries, the Name Index is incomplete as it does not, for example, contain 'Piaget, J.', 'Kuhn, T.S.', 'Chomsky, N.', 'Miller, D.', 'Skinner, B.F.', 'Eccles, J.C.' or 'Polanyi, M.' all of whom are discussed in the text. Doubtless if these seven names, which were just ones that I had occasion to look up, are not indexed, many others who are discussed are also overlooked. This is a major oversight by Bunge or whoever did the Indexing for Springer. The omission does a particular disservice to

researchers. A lesson for publishers is to re-employ copyeditors, but doubtless this will never happen; their invaluable, but expensive, contribution to the craft of publishing has been forever lost.

1 Publications

Willard Van Orman Quine, in his autobiography (which in contrast to Bunge's has minimalist commentary), mentions attending the 1956 South American Philosophical Congress in Santiago, Chile. The only thing about the meeting that he thought worth recording was his observation that:

The star of the philosophical congress was Mario Bunge, an energetic and articulate young Argentinian of broad background and broad, if headstrong, intellectual concerns. He seemed to feel that the burden of bringing South America up to a northern scientific and intellectual level rested on his shoulders. He intervened eloquently in the discussion of almost every paper. [Quine, W.V.O.: 1985, *The Time of My Life: An Autobiography*, Bradford Books, Cambridge MA, p. 266]

That congress was held sixty years ago when Bunge was 37-years old; he is now 97-years, with his intellectual energy little diminished. Bunge is the author of more than 60 books and 500-plus scientific, social-scientific and philosophical papers. Different of these have been translated into all the major, and some minor, European languages, as well as Asian languages. Since his 90th birthday, he has published books on philosophy of mind, philosophy of medicine, general philosophy, political philosophy, and has a book in press on scientific methodology - *Doing Science in the Light of Philosophy*. Additionally, in these past seven years he has published a dozen articles in theoretical physics, economics, philosophy of science, philosophy of medicine, and sociology.

Over his lifetime, Bunge has written on an enormous range of subject matters – philosophical foundations of physics, philosophy of quantum mechanics, philosophy of mind, materialism, philosophy of biology, foundations of mathematics, Newtonian mechanics, explanation in social science, ethics in science, science education, science and religion, philosophy of medicine, economics, and more. What distinguishes Bunge's *œuvre* is its consciously systematic nature, not just within philosophy, which itself is rare enough, but systematic across all intellectual disciplines. He is against fragmentation and compartmentalism in research and scholarly life. His constant refrain is that science has philosophical commitments, and that philosophy needs be done with awareness of science.

2 Growing Up in Argentina

Bunge was born in Buenos Aires in 1919. From an early age was set a demanding schedule by his liberal and politicised parents of reading literature in six languages: Spanish, English, French, Italian, German and Latin. This early multi-lingual drilling was of inestimable benefit to his education, allowing him to read the classics and the best moderns in their own words. It also freed him from dependence on commercial and ideological judgements about what books would be translated and published in Spanish in Argentina. The Argentina of Bunge's early life was far more a closed society than an open one; it was dominated by right-wing politics (Argentina supported Hitler's fascism and maintained diplomatic relations with Germany through to 1944), and by the reactionary Catholic Church which took its guidance from Pius IX's 1864 anti-modernist, anti-liberal *Syllabus of Errors* encyclical. Scarcely anything liberal, enlightened or socialist could be published in Argentina, and if it could be

published there was a very small market for it. Importing and reading foreign language texts was a requirement of decent education.

Bunge is critical of the mono-lingual limitations of the bulk of Anglo-American scholarship, where just bilingualism is considered praiseworthy. In a review of a major book on the sociology of philosophy Bunge laments that ‘everything the author cites is in English, even when the available translations are notoriously unreliable – as is the case with Kant, Hegel, Frege, Husserl and Heidegger’ [Bunge, M.: 2000b, ‘Philosophy from the Outside’, *Philosophy of the Social Sciences* 30(2), 227-245, p.228]. He criticises the author for discussing Descartes, but failing to mention two of his at-the-time most influential works. Pondering why this is the case, Bunge writes ‘Let me hazard a guess: he does not know of their existence because until very recently, they were not available in English translation’ (Bunge 2000b, p.236).

Chapters One and Two (50 pages), detail Bunge’s culturally-rich family life, childhood, elementary schooling and high school. His father, Augusto Bunge was a physician and was for twenty years one of the few ‘liberal’ members of the Argentine parliament. His mother, Marie Müser, was an immigrant German nurse. The detailed accounts of Patagonia holidays, games, shopping, gardening, schooling are all absorbing, the more so for non-Latin readers. Bunge’s memory for names, episodes, conversations from 70-80 years ago is phenomenal. The entire book was written from memory. Long Sunday lunches with a dozen or more artist, politician, academic, literary guests was the standard family pattern. Bunge served table, mixed punch, and picked up what he could from adult conversation. So, for instance, he reports:

A book that provoked many discussions was Julien Benda’s *La trahison des clercs*, (1927), the earliest and harshest denunciation of the prominent French and German intellectuals – among them the physicist Max Planck, the philosopher Henri Bergson, and the sociologist Max Weber – who had supported their respective governments during the Great War. Benda rightly accused them of betraying the intellectual’s commitment to truth. Nobody foresaw the silence of the vast majority of the German (and Argentine!) men of culture when confronted with the coming fascisms. (p.33)

At age twelve, he gained entry to the prestigious Colegio Nacional de Buenos Aires. This was a disappointment. He relates that teachers ‘instilled more fear than respect’, and ‘Most of our professors were not interested in teaching, and some of them were frankly incompetent’. During his largely barren high school years he was drawn to philosophy, saying:

I fell in love with philosophy [age 16] when I read Bertrand Russell’s *Problems of Philosophy* (1912). This book persuaded me that psychoanalysis was sheer fantasy. I also read, in no particular order, as is usual with amateurs, many books in the history of philosophy. I was duly impressed by the pre-Socratics, and later on by Spinoza and the philosophers of the French Enlightenment. My father’s library had a good edition of Voltaire’s complete works, which amused me but did not teach me about the philosophy-science connection. (p.43)

For political and fundamental ethical reasons Bunge was drawn to communist party literature and activity. He was never a party member, and relates how:

During the 1930s and 1940s I got to know a handful of communist intellectuals, none of whom did research of any kind, or even read journals at an international level. My closest

friend among them, Manuel Sadosky ... studied mathematics and eventually became a well-respected if mathematically unproductive university professor, the vice-dean of the Faculty of Science of the University of Buenos Aires and, half-a-century later, Argentina's first Secretary of Science and Technology.

Manuel opined on everything and dispensed advice on anything. He was a great believer in authority. He sided publicly with the charlatan Lysenko against genetics; he advised me to read the great Leibniz's *Monadology*, which I found absurd and backward; and he adopted John Bernal's *Social Function of Science* (1939) as his lifetime bible on science and technology policy. The eminent crystallographer had confused both domains to the point of supporting the planning of scientific research, thus deserving the criticism of Michael Polanyi. (p.40)

3 University Education

Chapter Three (20 pages) covers his undergraduate university education at La Plata National University. The pages are rich with accounts of professors, students, courses, politics (both university and national), and personal including Bunge's first marriage to architecture student Julia Molina y Vedia, and birth of his first two children (Carlos b.1941, Mario Jr. b.1943); the jailing of his mother and father; and the death of the latter. During this time, as he relates:

On starting university, I realized that, since my compatriots were paying for my studies, I had a duty to repay them. After gathering some information on what used to be called popular education, I decided to found the Universidad Obrera Argentina (UOA). I wanted this school to teach both vocational and humanistic studies to adult workers, because there were no schools where they could learn anything other than some household and office skills, and union activists had nowhere to undertake social studies.

Eventually there were 1,000 students in this adult workers' school. It was constantly monitored by police and eventually closed. He relates how it was undermined by not only the Calatrava fascists but also the Argentine Communist Party who, following Moscow directives, could bear no opposition in the field of workers' organisation; better no education for workers than socialist or liberal education.

His postgraduate physics education is dealt with in Chapter Four (25 pages). In 1943, for his physics PhD, Bunge started to work on problems of nuclear and atomic physics under the guidance of Guido Beck (1903-1988), an Austrian refugee, a student of Heisenberg, the inventor of the layer model of the atomic nucleus, the first to propose the existence of the positron, and a teacher who Bunge thanks for 'teaching me not to allow politics to get in the way of my science'. [Bunge, M.: 1991, 'A Critical Examination of the New Sociology of Science: Part 1', *Philosophy of the Social Sciences* 21(4), 524-560, p.524] Of the thesis, Bunge relates:

Beck proposed to me [age 23] a dissertation problem that he rightly assumed would interest me for its philosophical flavor, namely, to find out whether Dirac's quantum-relativistic theory of the hydrogen atom yielded kinematic results similar to Bohr's semi-classical model, such as the electron's velocity. He also wanted me to use the complicated state (or wave) functions he himself had recently introduced.

Unfortunately for both of us, I did not obtain the results Beck had hoped for. To begin with, his state functions, which involved matrices, complicated things without clarifying them. I believe he had fallen for the Viennese saying "Why do it simply if it also works in a

complicated fashion?” Beck’s version of the theory is so complex that I believe Feynman was right to use the simplest possible state functions.

Second, Beck erred both in the choice of the velocity operator and in the goal of the calculations – the spatial averages of the said operator not only in the case of the denumerable spectrum (the successor to Bohr’s orbits) but also in that of the continuous one. The first mistake was hardly avoidable at that time, when people tended to believe Dirac’s word as scriptural even though his velocity operator, namely ca is a 4x4 matrix whose eigenvalues are +infinity and –infinity, which would require an infinite energy even for an electron at rest. Later on I proposed a more reasonable velocity operator. But its average too turns out to be null if calculated with stationary “wave” eigenfunctions. (p.77)

Bunge was apprenticed to Beck, and a decade later, obtained his PhD in 1952 from the University of La Plata with a dissertation on the kinematics of the relativistic electron; the dissertation was published as a book in 1960. Subsequently he, alone or jointly with his former student Andrés Kálnay and other scientists, published several articles on problems in quantum mechanics: the total spin of a system of particles, the mass defect of the H atom, new constants of motion, the quantum Zeno paradox, the measurement process, etc

In the early 1950s Bunge worked for half a year with David Bohm in São Paulo. Bohm one of the stellar figures of theoretical physics had been forced out of Princeton and the USA by anti-communist McCarthyite pressure. Bunge’s appraisal of Bohm is characteristic of the interleaving of science and philosophy that so marks all his work, and so it warrants reproduction in full.

But, as I polished my philosophy, I became increasingly critical of Bohm’s views. Firstly, he had proposed more than a “reinterpretation” of the mathematical formalism of quantum mechanics: his was a new theory, since it contained two “hidden” (scatter-free) variables, the classical position and a newly defined momentum, that allowed him to define precise trajectories plus a new unobservable force, that would explain the quantum fluctuations.

Secondly, Bohm had not succeeded in eliminating randomness, for he had not even attempted to derive probabilities from non-probabilistic assumptions. So, it was wrong to call his theory ‘causal’. Just like the standard theory, Bohm’s had both causal and probabilistic features.

Thirdly, like Einstein – who had exerted a decisive influence on Bohm when they met in Princeton at the older man’s request – he had confused the concepts of causality and realism with what I called *classicism*, that is, the description of physical reality *par figures et mouvements*, in the Cartesian style.

Fourth, as Alfred Landé pointed out to me when we met in Venice, Bohm’s theory did not yield new testable results, and it did not suggest any new experiments – nor could it, since its distinctive variables were unmeasurable.

Finally, both sides of the controversy mixed up three mutually independent (non-interdefinable) philosophical categories: realism, causality, and classicism. It took me several years to notice these confusions. And two decades later, when the Bell inequalities were experimentally refuted, some physicists worsened the prevailing conceptual chaos by introducing the oxymoron ‘local realism’.

Reading Hegel in English translation must have added to Bohm’s confusion, and anyway turned him into a holist. When I asked him why he wasted his time reading that garbage, he replied that Hegel inspired him. (p.91)

4 Physicist and Philosopher in Argentina

Chapters Five and Six (60 pages) give fascinating accounts of the early days of Bunge's dual careers in physics and philosophy. In 1956 he was appointed a professor of theoretical physics at the universities of Buenos Aires and La Plata. In 1957 he won the chair of philosophy of science at the University of Buenos Aires, and a year later he resigned his physics chairs to concentrate on philosophy. He notes that it was only in 1954, aged 34 years, that he was first in receipt of regular income; for the first time in his life, he had a regular, paid, faculty position. Of his nascent philosophical interests, he writes:

From 1936 on, when I completed high school on my own, I read much philosophy, mostly bad, and some semi-popular physics books, in particular those by Arthur Eddington and James Jeans, both of them distinguished scientists and eloquent writers. They wished to "sell" philosophies that seemed wrong to me: Kant's subjective idealism, and Plato's objective realism respectively. Indeed, Eddington had stated that we discover what is already in our minds, whereas Jeans held that the universe is a mathematical construction. Moreover, both claimed that those are results of contemporary science.

Anyone could see that, if Eddington were right, anyone could understand physics without studying it; and that, if Jeans were right, pencil and paper would suffice to discover reality. But disproving the claim that physics is idealistic requires knowing a lot of physics, and I was far from meeting this requisite. This is what motivated me to start studying physics at the university, as described in chapter 3, and I have kept doing so ever since 1938, though slowly and sporadically. (p.103)

In 1958, Bunge celebrated his second marriage. This was to a Marta Cavallo, a very bright lively mathematics student who subsequently became a professor of mathematics at McGill when, in 1966, Bunge accepted that university's professorship in philosophy. They have now been married nearly sixty years and have two grown children (Eric b.1967, Silvia b.1973). All of this is retold in the book, not just by Bunge but also by Marta who has contributed a 20-page Appendix titled 'My Life with Mario'.

5 An International Philosopher

Tiring of the Argentine pattern of Peronist regimes being followed by military coups, and all the academic and political upheavals that attended each change, Bunge and Marta resolved on leaving Argentina, which they did in 1963. He took short-term appointments in the USA, teaching both physics and philosophy at the University of Texas, Austin and University of Delaware, until finally becoming a tenured professor of philosophy at McGill University in Canada in 1966. He has remained on the faculty for the following 50 years, teaching till aged 90 when Canadian compulsory retirement regulations required him to give up class teaching.

Chapters 8-15 (225 pages) detail these 50 years of stable, academic life and research carried on from his Montreal base. Of course, he did not remain in Montreal, but travelled extensively to conferences, congresses, and for series of invited lectures in numerous countries. These chapters alone occupy six of the book's Contents pages. The extensive sub-headings are a great, and necessary aid to easy reading and staying 'on track'.

To convey adequately the contents of these chapters – his elaboration and defence of realism, materialism, and emergent ontology; writing the 8-volume systematic treatise on

philosophy; his studies in biophilosophy; criticism of Copenhagen quantum mechanics; publications on philosophy of mind, cognitive science and methodology in psychology; critiques of orthodox economics and proposals for humane and scientifically-informed measures of national development; detailing a systematic ethical theory; the character and competencies of his McGill colleagues and many other colleagues who he met on the conference and congress circuits; and much else - would make this review inordinately long. For all the detail it is best buy the book.

6 Pen Pictures

Instead of proceeding with such an exhausting whole-of-life book review, the space will be given over to reproducing Bunge's own commentary on some select philosophers among the 1,200 people mentioned in his Name Index (plus Thomas Kuhn and Noam Chomsky who by oversight are not mentioned). The pen-pictures and brief asides do have substantive content, but each can be given more flesh by reference to the 100s of research articles where the philosophers' positions are elaborated and given detailed appraisal; the specific references are cited in the *Memoirs*. The following extracts are meant to merely point the way towards Bunge's appreciation of the philosophers and the issues that engaged them.

Karl Popper

On inspecting the bookshelves of the university library [Santiago, 1955], I noticed Popper's *Open Society*, published in 1945 but unknown in my country. It greatly impressed me immediately, for his attacks on Plato as a reactionary, and on Hegel as both reactionary and obscurantist. Back home, I wrote to Popper, and we quickly became friends, for we shared rationality and realism. Our friendship lasted until, two decades later, I criticized his three-worlds fantasy. Karl exalted criticism so long as it was not directed at him. Worse, as he said in 1969 at a meeting in his honor, he did not believe in constructive criticism – which shows that he was unfamiliar with the way scientific communities work. (p.119)

The 1965 Popper Conference

Right after the gravitation congress [1965] I attended the big conference in honor of Karl Popper at Bedford College that Imre Lakatos had organized. Again, there were several heavy-weights, among them Tarski, Bergmann, Carnap, Kuhn, Quine, and Suppes.

That was the conference where two great debates took place: Carnap vs. Popper, and Kuhn vs. Popper. In the former, Popper sent his faithful pupil, David Miller, to represent him. Right at the beginning of his talk, Miller committed an error in elementary probability theory. Carnap was quick to detect it, and in few minutes he tore down the Miller-Popper criticism of inductive logic. Everyone saw this as Popper's defeat, and proof of Carnap's intellectual superiority over him.

In retrospect, I think that Popper lost that debate because he shared Carnap's belief that propositions can be assigned probabilities. And obviously Carnap had given much more thought than Popper to probability theory. But neither of them gave any reasons for treating propositions as if they were random, and none of them drew the shallow/deep distinction I had made in my [own conference] paper.

There was also consensus about the Kuhn vs. Popper match. In my view Popper lost because he shared Kuhn's false assumption that scientific revolutions are so radical, that they sweep away all past knowledge. Worse, Popper started his talk by stating that he was not interested

in what Kuhn called “normal” science: he too was only interested in breakthroughs. But this concession did not appease Kuhn. Nor did it help Karl to ask Kuhn whether he might call him ‘Tom’: Kuhn kept his cold arrogance.

In addition, the discussants in that debate had only two breakthroughs in mind, those of Copernicus and Einstein, at a time when many others were in progress behind their backs, in particular quantum chemistry, molecular biology, cognitive neuroscience, and the *Annales* historiographic school.

In any event, the relativistic denial that scientific progress is cumulative is false. Science, like capital, starts from an initial endowment rather than from nothing, and it grows through positive feedback: new findings fuel the epistemic engine. This is why total revolutions are impossible in any field.

My verdict about the Carnap-Popper match is then quite different from the prevailing one: as the physical chemist Margot Bergmann put it to me, neither Carnap nor Popper knew what they were talking about – they were philosophers of second-hand science. (pp.170-71)

Joseph Agassi

I also met [1958] Popper’s assistant, the lively and friendly Israeli Joseph Agassi. He had so much curiosity, enthusiasm, and speed, that he found no time to study anything in detail and depth. I also met his interesting wife, the sociologist Judith Buber, the daughter of Margarete Buber, a writer and political activist who had been a victim of both Hitler and Stalin.

Years later Marta and I befriended the Agassis, corresponded with them, and met with them in several countries, including their own. I believe Joseph is Popper’s best pupil, and one of the few who neither flattered nor betrayed him. (p.139)

Nelson Goodman

The most interesting and also the most abrasive of my Penn colleagues [Penn State University, 1960] was Nelson Goodman, the author of *The Structure of Appearance* (1951), which I had read in Buenos Aires. When he took me for lunch at the Faculty Club, I told him that I admired this book for its clarity but not for its content, which was phenomenalistic: like Hume and Kant, Goodman regarded the universe as a collection of disconnected phenomena or appearances. This commonsensical worldview seemed to me to be anthropocentric and therefore inconsistent with the modern scientific worldview born around 1600. Goodman replied that content did not matter: that what mattered most was form or logical structure. He added that this is why he admired above all Rudolf Carnap’s *Der logische Aufbau der Welt* (*The Logical Construction of the World*), of 1928, which I had not read. That was the subject of his advanced course, which I attended only a few times because it did not interest me. (p.145)

Thomas Kuhn

Back in Freiburg [1966] I got an invitation from Jean Piaget, with whom I had interacted at several academic meetings. He invited me to attend a conference on causality. One of the participants was Thomas Kuhn, then basking in the success of his *Structure of Scientific Revolutions*. His presentation disappointed me for exhibiting his poor knowledge of the history of science. For example, I had to remind him about Johannes Philoponos’s theory of movement. According to Philoponos, an arrow keeps moving as long as it retains some of the *impetus* that the archer had imparted to it. The rule of this theory from the 6th to the 16th

centuries shows both the power of causal thinking and the artificiality of science – surely a subject of interest to a colloquium on causality.

Kuhn's presentation impressed no one at the meeting, and it confirmed my impression that his history of science was second-hand, his philosophy confused and backward, and his sociology of science non-existent. Fortunately, there were also a few good presentations and, of course, Piaget's interesting observations. (p.181)

Martin Heidegger

In Bonn [1969] I praised what since the mid-eighteenth century has been called *enlightened* philosophy, the one attached to rationality and willing to interact with science. I also praised Heinrich Scholz, who had been successively a professor of theology, philosophy, and logic, had spent part of the Nazi period under house arrest, and had hosted Tarski while fleeing from Warsaw to London. My praise did not go down well.

I contrasted Scholz's integrity and search for clarity with Heidegger's political servilism and obscurantism, and called him a *Kulturverbrecher*, that is, cultural delinquent. This remark too was received coldly, although nobody said anything. A few years later the Foundation felt obliged to organize a public homage to that charlatan. On that occasion Gadamer and Derrida praised him and had the nerve to deny that Heidegger had been an accomplice of Nazism. (p.209)

Stephen Jay Gould

I was of course a fan of Stephen Jay Gould's brilliant semi-popular essays in *Natural History*. But I also found that his thinking was philosophically muddled because of his reliance on the dialectics of Hegel and Engels. I attended Stephen's stimulating lectures at McGill, starting with the one he gave in 1968 while still an assistant professor at Harvard. In that lecture he asserted that paleontology is a branch of geology, perhaps because fossilization involves mineralization, and many fossils were discovered by geologists and prospectors. I wrote to Gould, reminding him that paleontology had begat evolutionary biology, and that the fact that geologists use paleontology to date strata is only an example of the interdependence of the sciences. Seismologists might yet invent a more accurate method of strata dating. The history of life is entwined with that of rocks, but paleontology is a part of biology because it studies organisms, whether alive or fossilized. Stephen and I exchanged a few more letters, until he told Reig [a McGill colleague] that he had changed his mind about my standing as a philosopher: whereas formerly he had placed me at the top, lately he had demoted me to the bottom of his totem pole.

A decade later Stephen and I had our last collision, this time at Boston University on the definition of "species". But our disagreements did not prevent me from regarding him, along with his colleague Richard Lewontin, and the British all-round biologist John Maynard Smith, as the leaders of the contemporary pro-evolution movement. The fact that all three were Marxists explains their commitment to evolutionary biology and its fusion with developmental biology, as well as their occasional conceptual howlers. (p.283)

Richard Dawkins

The decisive factor for my disillusion with sociobiology was reading Richard Dawkins's *Selfish Gene*, published the same year [1976] as Wilson's flawed but well-argued genetic determinism. Indeed, I instantly diagnosed Dawkins' genetic determinism as pseudoscientific. In fact, it was not based on new research, for Dawkins was but a popularizer; it was full of howlers, such as the statements that genes duplicate by themselves (rather than under the

action of enzymes), that they always override the environment; that the only evolution worth talking about is the biological one, which results from mutation and natural selection; and that, since the genome is the first mover of life, and since selection would act on genomes, not entire organisms, the very existence of organisms is “paradoxical” – that is, biology is redundant in Dawkins’s scheme. (p.297)

Noam Chomsky

I had nothing to say [1978] about Chomsky’s contribution to syntax, which in my view was of no interest to philosophers. But I objected to both his semantics and his psycholinguistics: I thought the former non-existent, and the latter at odds with cognitive neuroscience.

I objected to Chomsky’s nativism; in particular, his opinions that we are born endowed with a universal grammar and a linguistic theory that allows us to master any language without having to learn it. I believe this view to be but a gut reaction to the behaviorism ruling in American psychology until about 1960, as well as a consequence of Chomsky’s ignorance of Jean Piaget’s work in developmental psychology, which emphasized the child’s constructive (inventive) ability, denied by Chomsky as vehemently as by Skinner, the most radical of behaviorists.

I also rejected the hypothesis of innate linguistic intuition – which Chomsky called Cartesian and I saw as Kantian – which would allow anyone to judge instantly whether any given linguistic expression respects what the French call *le génie de la langue*. In addition, I held that Chomsky had produced no semantics – something that he himself ended up by conceding. Nor could I share his early enthusiasm for psychoanalysis and concomitant contempt for the experimental branches of linguistics – neurolinguistics, psycholinguistics, and sociolinguistics. Last, but not least, I regarded Chomsky’s said opinions as clear cases of pseudoscience.

At the same time, I share most of Chomsky’s criticisms of American foreign politics, and admire his courage in making them public. (pp.313-14)

Marxism

Dialectical materialism, which had seduced me as an adolescent, has seemed to me from about 1950 a coarse work of amateurs expounded and defended in a dogmatic fashion, from which a single nugget remains, namely the thesis that the world is material and changeable. The rest is either unintelligible, too sketchy, or just false. ...

... dialectical materialism is not a research project but a dying creed. Its latest prophet, Slavoj Žižek (2014), keeps repeating the same mixture of Hegelian with postmodern nonsense dressed in radical disguise. He rightly notes the reluctance of Marxists to even admitting scientific novelties –among which he includes the psychoanalytic fantasies – but he himself offers none, and even praises endless repetition. In short, in the twentieth century dialectical materialists have been an obstacle to all the sciences except history. Indeed, there have been some important Marxist historians, such as Eric Hobsbawm and Edward Thompson, as well as para-Marxists ones such as the original members of the *Annales* school (Fernand Braudel, Marc Bloch, and Lucien Febvre), and more recently Pierre Vilar, Robert W. Fogel and Eugene Genovese. (pp.261-62)

7 Enjoying Life

The penultimate chapter of Bunge’s *Memoirs* includes sections on how he enjoys life. Primarily, of course, this comes from engagement with his extended family now domicile in a

number of countries, but coming together at least twice per year for celebration of family life. Some of these gatherings are captured among the 52 photographs contained in the book. Bunge also lists the books, art, music, cinema and poetry that bring him enjoyment and enrich his life. Of literature, he writes:

I am a fan of great literature, from the towering triad made up by *Don Quijote*, *War and Peace*, and *La comédie humaine*, to Chinua Achewe, Jorge Amado, Margaret Atwood, Saul Bellow, Giovanni Boccaccio, Anthony Burgess, Dino Buzzatti, Italo Calvino, Peter Carey, Alejo Carpentier, Rosario Castellanos, J. M. Coetzee, Miguel Delibes, Alfred Döblin, Fiodor Dostoyevski, George Eliot, John Galsworthy France, Carlos Fuentes, Eduardo Galeano, John Galsworthy, Robert Graves, William Henry Hudson, Ismail Kadaré, Franz Kafka, J.M.G. Le Clézio, Primo Levi, Sinclair Lewis, Naguib Mahfuz, Hilary Mantel, Rohinton Mistry, Haruki Murakami, V. S. Naipaul, R. K. Narayan, Michael Ondaatje, Orhan Pamuk, Benito Pérez Galdós, Eça de Queirós, Mordechai Richler, Romain Rolland, Philip Roth, Salman Rushdie, José Saramago, Leonardo Sciascia, Vikram Seth, Wole Soyinka, Bruno Traven, Anthony Trollope, Mario Vargas Llosa, Kurt Vonnegut, Edith Wharton, Marguerite Yourcenar, and several others – such as Jane Austen, Umberto Eco, Henry Fielding, Thomas Hardy, Manuel Mujica Láinez, Machado de Assis, Vladimir Nabokov, Michael Ondaatje, Horacio Quiroga, M.J. Vassanji, Voltaire, and so on. (p.403)

Of poetry, he says:

I am no longer enthusiastic about poetry, except for Homer's *Odyssey*, Lucretius, Omar Khayyam, the Spanish *romanceros*, John Donne, Goethe, Heine, Shelley, Walt Whitman, Roberto Ledesma, and Antonio Machado. My knowledge of Italian history is insufficient to understand Dante, and my English too poor to fully appreciate Shakespeare: I only understand his popular plays. I dislike the latter Joyce's hermeticism, and T.S. Eliot for trying hard to be quotable as well as being a pro-fascist English gentleman. (p.403)

8 Bunge's Intellectual Style

Enough has been quoted from the *Memoirs* to bring to attention Bunge's academic and argumentative style. As mentioned above Quine in 1956 commented that Bunge was 'of broad background and broad, if headstrong, intellectual concerns'. In the Introduction to their 1982 *Festschrift* for Bunge, Joseph Agassi and Robert Cohen say that he 'stands for exact philosophy, classical liberal social philosophy, rationalism and enlightenment', and they go on to comment that 'he is prone to come to swift and decisive conclusions on the basis of arguments which seem to him valid ... he is emphatically autonomous in his judgment' [Agassi, J. & Cohen, R.S. (ed.): 1982, *Scientific Philosophy Today: Essays in Honor of Mario Bunge*, Reidel Publishing Company, Dordrecht, p.vii]. Exactness and quickness are recurring terms that are used to describe Bunge's style; this is an accurate description as is evident in any cursory reading of any of his voluminous work. There is little in these *Memoirs* that would cause a revision of Quine's, or Agassi and Cohen's judgements.

In 1978 there was a celebrated occasion involving Bunge which is still remembered by many who were present, and that made the front page of a German city newspaper. It was the International Congress of Philosophy held in Düsseldorf Germany, and Sir John Eccles – the famous neurophysiologist who collaborated with Karl Popper in articulating a dualist but interactionist theory of mind [in their well-known *The Self and Its Brain*, from 1977], and who had just been awarded the Nobel Prize - was invited to give the opening plenary address. Instead of the customary deference that might be expected to be given to a newly-minted Nobel laureate, Bunge, who was in the audience, stood up and accused Eccles of

philosophical incoherence and of retarding the scientific study of mind. Many philosophers, including those who agreed with Bunge's views, thought that it was not the occasion for the arguments to be aired. Bunge thought differently; he has a different style. This was an invited address, so Eccles was a guest, yet it was an official philosophy congress. His intervention was in a grey zone between the requirements of decorum and politeness and a scholarly organisation's concern to promote knowledge and understanding. The episode is referred to on pages 307-308 of the *Memoirs*. Unfortunately, 'Eccles' is one of the many names not listed among the 1,200 in the Name index, so the episode is not easily located.

In matters of academic debate Bunge believes the argument should be stated as clearly and exactly as possible; and stated whenever warranted; lights should not be kept under bushels, and spades should be called spades. He has no regard for 'soft-focus' writing or argument. Instead of saying 'It could be thought that there is a weakness in your argument', he prefers the more direct 'Your argument is weak'. Instead of warm and pleasant agreement about claims that cannot be tested, he seeks clear, specific hypotheses that can be tested against evidence. Bunge here violates some scholars' understandings of academic 'good manners'. Between the rise of postmodernist conceptual incoherence and rightful concerns about giving offence, the promotion of direct and clear academic writing struggles at the present time; indeed it is positively discouraged in numerous quarters where even correction of student writing is thought to be a dubious practice.

In personal dealings Bunge is polite, attentive and concerned with the well-being of those about him. Office staff in the School of Education at UNSW where he spent a semester's leave in 2001, said he was the most polite, considerate and courteous visitor that the School had ever had. Such estimations are, of course, usually not part of the public record. So, it is the learned but combative Bunge that the scholarly community knows. His style has had its professional price; it probably provides some explanation for why his wide-ranging and informed corpus of work has not been as engaged with as one might expect.

9 Bunge and Liberal Education

The *Memoirs* open a rich mine of fundamental questions in physics and philosophy, but additionally they bring into focus an important educational issue. The *Memoirs* are a stark testament to the fact that Bunge is one of a small number of scholars able to competently range over the disciplines of physics, social science, psychology, biology, history of science and philosophy. Such multi-disciplinary competence is slowly, indeed rapidly, disappearing. From graduate student years, through to tenure decisions and beyond, there are enormous pressures on academics to publish quickly, which means to specialise; and as the cliché has it, to learn more and more about less and less. This is a misfortune for the conduct of science as it severely limits cross-disciplinary fertilisation and research programmes. It is a particular misfortune for the conduct of science education research where competence in, at least, philosophy and psychology is needed to avoid the wasted effort caused by enthusiasm for passing philosophical and educational fads that distract, if not completely derail, the research community – for instance, behaviourism in the 1960s and 70s and constructivism in the 1980s and 90s [Matthews, M.R.: 2015, *Science Teaching: The Contribution of History and Philosophy of Science*, Second Updated Edition, Routledge, New York, chap.12].

Lack of cross-disciplinary competence also stands in the way of good science teaching. The interconnectedness of the scientific endeavour is lost, and the rich impact of science on the history of culture is ignored. Ten years after Bunge was born, a popular text

used for the preparation of English science teachers was published - *Science Teaching* (1929). The author, F.W. Westaway, was trained as scientist, he wrote on scientific method, on the history of science, and he was His Majesty's Inspector for Science in English Schools. On the opening page of his textbook he characterised a successful science teacher as one who:

knows his own subject . . . is widely read in other branches of science . . . knows how to teach . . . is able to express himself lucidly . . . is skilful in manipulation . . . is resourceful both at the demonstration table and in the laboratory . . . is a logician to his finger-tips . . . is something of a philosopher . . . is so far an historian that he can sit down with a crowd of [students] and talk to them about the personal equations, the lives, and the work of such geniuses as Galileo, Newton, Faraday and Darwin. More than this he is an enthusiast, full of faith in his own particular work.

This is a lovely account of what constitutes a good school science teacher; and it is doubtful if, after the subsequent millions of educational publications, anything better and clearer has been written. If transposed to the university level, and elaborated, it well-fits Mario Bunge the physicist-philosopher as revealed in these *Memoirs*.