

HPS&ST Note

Inter-Divisional Teaching Commission of the International Union for the History and
Philosophy of Science

September 2015

Dear HPS&ST Colleagues,

Some matters to relate.

Mario Bunge's 96th birthday

In the past few months I have circulated obituary notes for senior philosophers who have contributed to research and discussions in science education – Stephen Norris, Michael Martin, Abner Shimony – and also Jaakko Hintikka who played a pivotal role in creation of the IHPST group. Given that there is only a small pool of such philosophers who seriously engage with science education, it is appropriate to celebrate not the passing away of one of them but their reaching a rare birthday.

On September 21, the philosopher and physicist Mario Bunge celebrated his 96th birthday. He is in sparkling good health and fine mental form. Hopefully in a few years he will be celebrating his centenary with family, friends and the wide international circle of colleagues across many disciplines who have valued and benefited from his nearly eighty years of publication in physics, philosophy, psychology, economics, cognitive science and sociology.

Mario was born in Argentina in 1919. As an undergraduate physics student he learnt atomic physics and quantum mechanics from an Austrian refugee who had been a student of Heisenberg. Additionally he taught himself modern philosophy in an environment that was a philosophical backwater. He was the first, and for decades remained the only, South American philosopher of science to be trained in science.



Accounts of his life

Two accounts of his life and work have been published in two thematic issues of *Science & Education* that were dedicated to appraisals of first his contribution to the philosophy of quantum mechanics (vol.12 nos.5-6, 2003) and a decade later to appraisal of his overall systematic *oeuvre* (vol.21 no.10, 2012). See:

<http://link.springer.com/article/10.1023/A%3A1025364722916>

<http://link.springer.com/article/10.1007/s11191-012-9530-0>

Spanish readers can read a recent interview with him in *Clarín* magazine:

http://www.clarin.com/viva/Revista_Viva-Mario_Bunge-capitalismo-progresismo-peronismo-kirchnerismo_0_1421857938.html

The interview ranges widely over Argentine history, politics, philosophy and culture. In the interview he estimates having read 10,000 books in his lifetime; enviably he has astonishing recall of their content.

Publications

His publications in physics, philosophy (including medical philosophy), psychology, cognitive science, sociology, foundations of biology and criminology are staggering in number – at least 30-40 major books, and perhaps 500 articles and book chapters. He has given invited lectures in a score of countries and his work has appeared in at least a dozen languages.

His contributions to *Science & Education* journal have been:

Bunge, M.: 1996, 'Is religious education compatible with science education?' (with Martin Mahner) *Science & Education* 5:101-123.

Bunge, M.: 1996, 'The incompatibility of science and religion sustained: A reply to our critics' (with Martin Mahner) *Science & Education* 5: 189-199.

Bunge, M.: 2000, 'Energy: Between Physics and Metaphysics', *Science & Education* 9(5), 457-461.

Bunge, M.: 2003c, 'Twenty-Five Centuries of Quantum Physics: From Pythagoras to Us, and from Subjectivism to Realism', *Science & Education* 12(5-6), 445-466.

Bunge, M.: 2003, 'Quantons are quaint but basic and real. *Science & Education*' 12: 587-597.

Bunge, M.: 2011, 'Knowledge: Genuine and Bogus', *Science & Education* 20(5-6), 411-438.

Bunge, M.: 2012, 'Does Quantum Physics Refute Realism, Materialism and Determinism?', *Science & Education* 21(10), 1601-1610.

The unifying thread of his scholarship is the constant and vigorous advancement of the Enlightenment Project, and criticism of cultural and academic movements that deny or devalue the core planks of the project: namely its naturalism, its search for objective truth, its commitment to universality of science, its championing of evidence-based rational thinking in all areas of government policy and personal life, and its respect for individual rights against their authoritarian subjugation in political, religion, philosophical and above all scientific spheres. At a time when specialisation is widely decried, and its deleterious effects on science, philosophy, educational research and science teaching are recognised it is salutary to be reminded of how one person pursued the 'Big' scientific and philosophical picture; the distinctly unfashionable Grand Narrative.

Post Age-90 publications

Age has not much wearied Mario, at least not mentally. Since turning 90, he has published the following books and articles:

- Bunge, M. 2012a. *Evaluating Philosophies*. *Boston Studies in the Philosophy of Science*, vol. 295.
- . 2012b. *Filosofía para médicos*. Barcelona, Buenos Aires: Gedisa.
- . 2012c. *Provocaciones*. Buenos Aires: Edhasa.
- . 2012d. The correspondence theory of truth. *Semiotica* 188: 65-76
- . 2013a. *Medical Philosophy*. Singapore: World Scientific.
- . 2013b. Bruce Trigger and the philosophical matrix of scientific research. In S. Chrisomalis and A. Costopoulos, eds., *Human Expeditions Inspired by Bruce Trigger*, Toronto: University of Toronto Press. pp. 143-159.
- . 2014a. *Evaluando filosofías*. Barcelona, Buenos Aires: Gedisa.
- . 2014b. In defense of scientism. *Free Inquiry* Vol.35, No. 1, pp. 24-28.
- . 2014d. Wealth and well-being, economic growth, and integral development. *International Journal of Health Services* 42(1): 65-76.
- . 2014e. Big questions come in bundles, hence they should be tackled systematically. *International Journal of Health Services* 44 (4): 835-844.
- . 2015a. Does the Aharonov-Bohm effect occur? *Foundations of Science* 20: 129-133.
- . 2015b. A systemic approach to the climate change challenge. Internal document, Academia Argentina de Ciencias Exactas, Físicas y Naturales.

Climate Change Manifesto

The last publication is the draft of a Climate Change Manifesto that Mario was asked to write so as it could be formally considered by the Academia Argentina de Ciencias Exactas, Físicas y Naturales. The opening paragraphs of the draft state:

The undersigned, members of the Academia Argentina de Ciencias Exactas, Físicas y Naturales, share Pope Francis's concerns with anthropogenic climate changes, as well as the need to address them by taking radical measures, as expressed in his recent encyclical *Laudato si*.

We understand that Pope Francis intended his words to reach not just his flock but the whole of humankind, because the irreversible losses of natural resources caused by oil spills and strip mining, along with droughts and floods, tornadoes and tsunamis, as well as by the massive melting of Polar ice caps and permafrost, the evaporation of snow covers on high ground, and the unusually quick succession of climatic catastrophes, are rendering modern society unsustainable.

Only cranks and lobbyists for special interests deny that such catastrophes are occurring largely due to uncontrolled human agency, in particular the relentless emission of carbon dioxide in amounts so large that they cannot be fully absorbed by forests, particularly since these are being felled at a much higher rate than that of reforestation.

Science is fingering us, not nature, for many of the recent climate changes. But, of course, science alone cannot solve a problem that is both technological and social. As Pope Francis

has stated, the increasing magnitude and frequency of climate calamities requires scientifically grounded, systemic, radical, and quick responses. For one thing, since climate is not regional but global, all the measures envisaged to control it should be systemic rather than sectoral, and they should alter the causes at play – mechanisms and inputs – rather than their effects.

Mario's systematism and naturalism are manifest in the text. The document is presently before the Academia for its determination.

Memoirs

Mario's current project is seeing through to publication his *Memoirs - Between Two Worlds* - which are being published by Springer in 2016. They are a fascinating and informative read. With his command of the major European languages and competence in so many disciplines, he has for at least seventy years been a citizen of the world. He has personally met and engaged with a roll-call of major 20th-century physicists, philosophers, psychologists, biologists and cognitive scientists. The 200,000+ words of the Memoirs cover these engagements and his appraisals of the people and their intellectual and, where appropriate, their political positions.

The Name Index is akin to a Who's Who of modern philosophical life. Just a few of these names well-known in the Anglo world are: Piaget, Kuhn, Popper, Lakatos, Goodman, Quine, Agassi, Eccles, Bohm, Gould, Putnam, Armstrong, Rescher, Ayer, Tarski, Agazzi, Montague and Berlin. Doubtless the name of every major 20th-century Latin American philosopher of science appears in the work; and not only appears, but Bunge seems personally to have met them all and has located them on the axes of the scholarly landscape that he lays out: objectivism/subjectivism; idealism/realism; isolationism/systematism; serious/frivolous.

The following paragraphs (non-sequential and taken from their contexts) give some sense of the style and content of the *Memoirs*.

Beginning philosophy

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.

I never had to opt between science and philosophy. Both attracted me equally from the moment of my intellectual awakening at about sixteen, as I discussed in chapter 2. True, I once thought I had found the demarcation line between them: whereas science is the study of reality, philosophy equals metascience, or the study of the study of reality (Bunge 1944c). But eventually I realized that science in the making involves a number of philosophical presuppositions – such as that the world pre-exists us and can be explored – so that the two domains have a partial overlap (e.g., Bunge 1967b, 1983b). In other words, whereas *scientia lata* can be described without mentioning philosophy, *scientia ferenda* cannot, so that scientific investigators cannot help but philosophize.

Science and philosophy

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.

For example, last summer I discovered that the so-called Aharonov-Bohm effect is not a physical fact but a misunderstanding that can be cleared through a semantic analysis (Bunge 2014c).

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 as 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.

Right after the gravitation congress (1969) 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. My talk discussed the differences between shallow and deep scientific theories, or those that merely organize data, and those that go beyond them, for they involve concepts that do not occur in data (Bunge 1968b). I also offered comments on some presentations, notably on Abraham Robinson’s, that had given the old infinitesimals, ridiculed by Berkeley, a new lease on life.

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 paper. This distinction shows why it is impossible to generate deep theories out of empirical data – whence the utter uselessness of both inductive logic and Popper’s alternative verisimilitude calculus.

Besides, both rivals dealt with single hypotheses rather than with hypothetic-deductive systems, and both believed that a hypothesis stands or falls according as it fits or fails to fit

the relevant empirical data: they ignored the condition I call *external consistency*, or compatibility with the bulk of antecedent knowledge. For example, most scientists will reject out of hand any hypothesis violating energy conservation.

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.

Biology

In 1963, while visiting Osvaldo Reig at Harvard, he introduced me to George Gaylord Simpson and Ernst Mayr. These two great scientists looked quite different: Simpson was short and reserved, whereas Mayr was tall and exuberant. Simpson remained silent, whereas Mayr declared in a loud voice: “I have read your *Causality*. It is a modern classic. But you are quite wrong in placing biology in the same bag with physics. All electrons are the same, whereas no two organisms are identical.”

Shortly thereafter I wrote to Simpson asking him to criticize the draft on biological systematics I had written for my future *Scientific Research*. I wanted his view on the species-genus relation: was it one of membership or, as I argued, one of set inclusion? And how about phylogenetic relations? Do species emerge before their genera or, as I thought, was it the other way around? Simpson sent me his detailed and patient response, which I adopted.

Both scientists were extraordinarily prolific, and both were interested in deep philosophical questions, but I thought that Simpson was clear-headed while Mayr was muddled. Moreover, I believe that Mayr’s emphasis on the uniqueness of living beings and their science, as well as his fight against essentialism, was obscurantist and possibly a result of his early exposure to German idealism.

Sociology

My next contribution to sociology was my mathematical analysis of the concept of social structure (Bunge 1974b). Peter Blau and a few others had dealt with this problem using only intuitive ideas. I started with the concept of an equivalence class, which generalizes that of equality. For example, in theory we are all equal, but in practice we are only equivalent in certain respects, such as occupation and income bracket. Every equivalence relation induces the partition of a collection of individuals into a family of non-overlapping groups, like pizza slices. The overall structure of the original collection may then be defined as the heap of such “pizzas” cut by as many equivalence relations as desired. Once such a framework is constructed, it can be filled with social statistics: the number of people in every cell or set can be counted, and updated as time goes by. This style of theory construction is unusual in social science, which comply with the empiricist rule: data should prevail both at the beginning and at the end.

This paper served as the basis of another (Bunge & García Sucre 1976), about social participation, marginality, and cohesion. The Venezuelan theoretical chemist Máximo García Sucre, a colleague of Kálnay’s at the Instituto Venezolano de Investigación Científica – in which I lectured several times – visited often my Unit from 1974 on. Once, after one of my lectures in scientific metaphysics, I wondered aloud what holds people with different interests together in social systems of various kinds, and what does it mean that some of them remain at the margin. The Marxist scholars were not helpful, even though they shared Rousseau’s great insight, that inequality is the root of all the major social issues. With very few exceptions, they are not even familiar with the indicators of income inequality, such as Gini’s, and they do not ask themselves whether participation plays any role in attaining and

preserving cohesion. This very question may embarrass them because of their adherence to Marx's infamous proposal of the "dictatorship of the proletariat."

Wittgenstein

I have attended several Wittgenstein symposia, held in the Lower Austrian village of Kirchberg, at whose elementary school Wittgenstein had earned a reputation of fondness for physical punishment. In my keynote speech of 1986, I analyzed the relation between the science of mind and ten popular philosophies of mind, most of which owed nothing to the former (Bunge 1987c). At these meetings one was sure to meet interesting people of different backgrounds. Once the learned priest Józef Bocheński OP grilled me thoroughly during a long lunch under the sun to find out how good an Aristotelian I was. He was not shocked at my materialist philosophy of mind. After all, The Philosopher had taught that, far from being detachable from the body, the soul was but its "form" – a conveniently vague term.

Sociobiology

The decisive factor for my disillusion with sociobiology was reading Richard Dawkins's *Selfish Gene* (Dawkins 1989) published the same year 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), and 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.

As if his nonsensical genetic determinism were not enough to tar and feather Dawkins as the pseudoscientist of the day, he also invented the meme, or unit of cultural evolution, and tried – unsuccessfully this time – to sell his memetics, or "science of memes." Dawkins' *dicta* were so simple and outrageous, and so in tune with the prevailing nativism recently reinforced by Chomsky, that he became instantly famous, even among skeptics, who care more for Dawkins's irreverence than for his lack of scientific credentials and his utter insensitivity to everything social.

Scientific realism

Finally, from Salzburg we went to Vienna, where I was expected to participate in the 14th World Congress of Philosophers (1968). I gave an invited talk on scientific realism, which differs from both naive realism and the Platonic realism of ideas. Its main theses are that the world external to the knowing subject exists independently from the latter and that it can be known partially and gradually through the scientific method (see Mahner ed. 2001).

Scientific realism differs from the "critical realism" that Roy Bhaskar and his faithful, most of them social scientists, have been cultivating at Oxford and environs. This school does not use any formal tools and it ignores science. Because of these limitations, their members have been unable to participate in the most important scientific-philosophical controversies of our time, such as: appraisal of the Copenhagen school, the reality of species debate in biology, the mind-body problem, and the scientific status of standard economic theory. The low power of critical realism is partly due to its ontological neutrality, in particular its indifference to the idealism/materialism disjunction.

The failure of critical realists to participate in those controversies is characteristic of any epistemology divorced from ontology – a divorce consecrated by empiricists but not by

scientists. Indeed, one cannot even start studying an object without assuming something about its nature: whether it is real or imaginary, material or ideal, physical or living, individual or social, and so on. The moral is that we should strive for the fusion of realism with idealism, as Plato had done, or with materialism, as I have attempted to accomplish with what I call *hylorealism* (see Bunge 2006a).

Engaged philosophy

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.

And so the *Memoirs* go on for 200,000+ words and 50 photos. Springer expects them to be published in late 2016.

1st European IHPST Regional Conference:

Science as Culture in the European Context: Historical, Philosophical, and Educational Perspectives

August 22-25, 2016
Europa-Universität Flensburg
Flensburg, Germany

Chairs- Peter Heering & Claus Michelsen (ihpst16@uni-flensburg.de)

http://ihpst.net/content.aspx?page_id=22&club_id=360747&module_id=189361

*Gratis Downloads of SC&ED Articles*

To mark the occasion of my retirement as editor of SC&ED journal and the appointment of Kostas Kampourakis as my successor, Springer have made nine journal articles 'open access' where they can be freely downloaded until September 30.

The package of nine articles, along with Kostas' invitation to submit to the journal, can be accessed at:

http://www.springer.com/?SGWID=0-0-1500-2451081-0&utm_campaign=CON26379_1&utm_medium=newsletter&utm_source=email&wt_mc=email.newsletter.8.CON26379.internal_1

Among the articles are the following relating directly to my retirement:

- [Reflections on 25 Years of Journal Editorship](#) - Michael R. Matthews
- [Succeeding Michael R. Matthews](#) - Kostas Kampourakis
- [What Makes a Life Worth Living? An Essay in Honor of Michael Matthews](#) - Gerald Holton
- [Religion, Misallodoxy and the Teaching of Evolution: The Influence of Michael Matthews](#) - Michael Ruse
- [Science & Education in Educational Perspectives: Recognizing the Contributions of Michael R. Matthews](#) - Zoubeida R. Dagher, Peter Heering

Ernst Mach Centenary Conference 2016

Ernst Mach (1838-1916) – Life, Work, and Influence: An International Conference
University of Vienna and Austrian Academy of Sciences, June 16-18, 2016. The Call for Papers and other information is available at:

<http://www.univie.ac.at/ivc/MachCentenaryED.pdf>

Questions can be directed to the local organizer Friedrich Stadler:
Friedrich.Stadler@univie.ac.at

Unfortunately Mach's sterling and insightful work as an educator, both a theorist and practitioner, is not as well-known in the Anglo-American community as it deserves to be. If known at all, his work is often dismissed in the more general trite dismissal of all things positivist.

Sixth Integrated History and Philosophy of Science conference (&HPS6)

July 3rd-5th 2016, School of Philosophy, University of Edinburgh

This is the 6th conference of a very successful series of international conferences under the general heading of Integrated History and Philosophy of Science that for the first time is held in the UK. The conference will feature three full days of contributed papers and invited talks that integrate the historical and philosophical analysis of science (i.e., the physical sciences, life sciences, cognitive sciences, and social sciences).

For details and call for papers, please visit:
<https://philosophyofsciencenetwork.wordpress.com/hps6/>

Deadline for submission of contributed papers: 23 November 2015.

*Submission of items*

If you would like any HPS&ST item included in a future mailing, please do send details direct to Michael Matthews: m.matthews@unsw.edu.au

*Assistance required*

Assistance is needed with the on-going task of locating suitable HPS&ST information (news, conferences, publications, jobs, etc.) for this periodic communication and also in extending its audience. This assistance extends to work of the Inter-divisional Teaching Commission of the IUHPS.

The basic requirements are web skills, and enthusiasm for the HPS&ST community, its research and its various projects. It is not anticipated that much time would be involved, but the tasks will include a good portion of what used be called 'leg work', but now better described as 'web work', and so is suitable for a graduate student or junior faculty.

Inquiries with CV and introductory note can be directed to the undersigned.

Michael Matthews