

# PHILOSOPHY & SCIENCE: connection, disconnection, consequences



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## ABSTRACT

In the beginning, they were one. As the social division of labour accelerated and knowledge advanced, philosophy and science diverged further and further from each other, bringing us to the situation today. All disciplines proliferate into sub-disciplines of sub-disciplines. We know more and more about less and less. Who sees the whole picture? The lecture will sketch the historical trajectory of intellectual specialisation, its advantages and its disadvantages. It will focus particularly on the need of science for philosophy and the consequences of lack of philosophical grounding for science.

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In the beginning, they were one. Science and philosophy were the same process. Scientia means knowledge. Philosophia is love of wisdom. In our western tradition, we trace the history of science and the history of philosophy to the same sources. Philosophy was once all knowledge.

Even today we still have chairs of physics that are called chairs of natural philosophy. I have seen biotechnologists, computational linguists and mechanical engineers being awarded the degree of doctor of philosophy. But these are anachronisms. The inherited words do not fit the reality of the structure of knowledge any more.

We have evolved - in fits and starts, in coherence and contradictions, in lucidity and darkness - we have advanced in complexity.

From the earliest times our species strove to understand, stumbling in the dark, naming stones, seasons, gods, projecting the known into the unknown. Perhaps the thunder was the voice of an angry god.

Or perhaps, not. The first fragments, the first names known to us in making a great breakthrough in knowledge – Thales, Anaximander, Heraclitus, Democritus, Pythagoras, Parmenides, Zeno – no longer projected the properties of the natural world into a supernatural world, but sought to explain the natural world in terms of forces within the natural world. They were scientists. They were philosophers.

In the classical period of ancient Greece, the great questions of the history of philosophy, still relevant, but rarely articulated today – were pondered: materialism v idealism, monism v pluralism, universality v relativity. The answers to these framed the development of science.

As we evolved, a division of labour – in knowledge as in much else – was necessary to advance. Aristotle, distinguished ancient scientist and philosopher – did distinguish between physics and metaphysics, but they were in continuity with one another. They were interdependent. They were mutually constituting.

In the medieval world, all knowledge was subordinated to theology. There was a prolonged struggle to liberate both science and philosophy from its rule.

Even within the constraints, there was some contestation, often with severe consequences. This made it very difficult for knowledge to advance.

Peter Abelard, for one, defended secular knowledge, argued passionately for argument to be based on evidence, on reasoning and not on authority.

During the period of the rise of universities, there was much dispute on faith v reason, on revelation v experimentation, preparing the way for the scientific revolution of the modern era.

To make the transition from the medieval to the modern world, it was necessary to break through at the level of epistemology, to establish the hegemony of experiment and reasoning over faith and authority.

The trial of Galileo was a point of high drama in what was a prolonged struggle, a struggle that is not over, even today. Philosophy was essential to the liberation of science from the forces constraining it.

The epistemologies of the modern era, rationalism and empiricism, contrasting as they were, was nevertheless both grounded in individual consciousness and its capacity for discovery.

Philosophy was a central part of the struggle to make the world safe for science and for commerce. There were a number of forces in motion: from the struggle of the rising bourgeoisie v feudal power in all its forms to the invention of new technologies of discovery, but philosophy

was essential in making the case at the level of world view, at the level of epistemological criteria, at the level of alternative ethos.

The enlightenment continued in this trajectory, making the arguments all the more explicit.

However, there was a counter-action in the romanticist reaction against the enlightenment. This tension is with us still in many new age fads and in a rash of pseudo-science, occupying the shelves of bookshops where philosophy used to be.

For the past few centuries there has been greater complexity of competing forces in motion, particularly at the level of world view. The advance of science has been a powerful force in shaping contemporary consciousness. The impact of evolutionary ideas has been revolutionary, most so in identifying natural origins of natural species, in seeing all that exists as in process.

Again philosophy was crucial to the articulation of implications of these advances. More naturalistic, processive philosophies entered the arena.

Marxism most dramatically emerged into this milieu. I have written a big book on what marxism represents in terms of the interaction between philosophy, science and politics.\* Marxism as a philosophy of science is materialist in the sense of explaining the natural world in terms of natural forces and not supernatural powers. It is dialectical in the sense of being evolutionary, processive, developmental. It is radically contextual and relational in the sense of seeing everything that exists within the web of forces in which it is embedded. It is empiricist without being positivist or reductionist. It is rationalist without being idealist. It is coherent and comprehensive while being empirically grounded.

Other philosophies too were concerned with securing the place of science in the world: positivism in particular. It was motivated by the desire to purify knowledge, to clear out the slag of superstition accumulated over centuries and to set out uncontested demarcation criteria for deciding what was a legitimate claim to knowledge and what was not.

After this came many modifications in various forms of neo-positivism until the total reversal that was post-positivism. Along this trajectory is where most philosophy of science is today. Also along this spectrum we find the default philosophy of science of many scientists.

However, philosophy of science has become ever more specialised and esoteric and more remote from actual science. Philosophers on the whole have retreated into the subdivisions of their own discipline, sometimes becoming more technical, sometimes becoming more fuzzy, but always becoming more insular, publishing in journals that no one else ever reads.

Meanwhile, scientists proceed to do science, mostly with very little in the way of philosophical reflection on its methods, implications or consequences.

Experiments proceed and the empirical data accumulates, but who knows how it all adds up, what it all means, what the overall shape of it is ?

The separate sciences are in the grip of an escalating specialisation that makes it almost impossible for scientists to understand what is being said by other scientists within the subdivisions of their own discipline, let alone by scientists in other disciplines.

Gone are the days of the scientist who knew all of science or even of the physicist who knew all of physics.

The education of scientists has become ever more narrow. Suggestions about including history, philosophy, sociology, political economy of science are met with the response that the curriculum is too full already and that there is no time for it.

Why should scientists need philosophy? First of all, they need philosophy for the same reason as anyone needs philosophy. For a person to mature intellectually, they need to question their received world view, to look around at the alternative world views offered by others, to come to their own conclusions about their basic beliefs. Do they believe that a supreme being, a god, created the world or do they believe that matter evolved into higher and higher forms? Can history be reconstructed as a coherent story or it is an irreducibly plural play of fortuitous circumstance?

Within the framework we construct by arriving at our own answers, we live our lives, organise our work and scientists pursue science.

Because many scientists do not do this very deliberately and rigourously, they tend to be somewhat schizoid. They are rigourous in the laboratory but all over the place, even credulous, in the rest of their lives. They may be positivist in conducting experiments and reporting results, but conventional catholics who believe that bread is transformed into the body of a dead but living god and dress their daughters as little brides when they consume this bread-body for this first time.

Is there anything wrong with that picture? It is common enough to seem normal. What is such a person's world view? What are their criteria for deciding what to believe? It is one basis for science and another for life. To me, it makes no sense.

There is a need for epistemological criteria to live a consistent and meaningful life and to pursue science. Scientists may or may not be doing useful science in a very specific way, but they are undermining science in another way.

There is widespread distrust of science. There is confusion about its cognitive status. There is suspicion of its veracity and morality with the increasing commercialisation of science.

We live at a time of epistemological crisis. The air is full of contending claims – and not only contending claims – but conflicting criteria about how to sort out these contending claims. How to sort it all out? How to decide what to believe? This requires philosophical thinking.

Look at the intellectual landscape of our time. It is full of all sorts of sense and nonsense. Look at the many manifestations of nonsense where sense should be. Look at the articulations of science

in our culture: from the minutiae of molecules to the tao of physics. Did you see the film “What the bleep do we know?” Science itself is invoked to justify mysticism and obscurantism.

Quantum physics – in hopelessly garbled interpretations – is used to justify just about everything that anyone wants justified. Ludicrous misinterpretations of Heisenberg’s uncertainty principle abound. Where are the scientists – in this case especially the physicists – entering into polemic about this? In the 1930s, eminent scientists, mostly marxists such as Bernal, Haldane, Needham, took on the ideas of Jeans and Eddington and others who were importing irrationality into science itself and undermining the role of science in interpreting the world within the wider culture.

There is a particular need in our time to address the questions of what is science, what is pseudo-science and what is anti-science – what are our criteria for drawing a line between what is a legitimate claim to knowledge and what is not.

Moving from the epistemological to the ontological dimension, what picture of the world, of ourselves, is emerging from the advance of science along so many empirical fronts? Who sees the whole?

There is a fracturing of consciousness that is intensifying all the time.

There may have been some need to for an intellectual division of labour and for resulting specialisation for us to advance, but the escalating separatism of the sciences and other disciplines needs to be transcended for us to advance further.

Nature does not respect our academic division of labour. There are problems that simply cannot be solved within the boundaries of one science. The progress even of the separate sciences is constricted by their separation from other sciences.

How can this state of affairs be overcome and by whom? The way forward, I believe, must be forged empirically, by scientists as scientists. However, to do so, they must have an adequate and appropriate philosophy. Here the philosophers have a part to play, but only as part of a common enterprise in which scientists must become far more philosophical and philosophers must come to know far more about science.

Not any philosophy will do. Certain philosophical assumptions will block the view and obstruct the path. Others will illuminate the way and move the journey onwards.

There is an optimal philosophy for science, I believe. It is an evolutionary, integrative, emergentist form of materialism.

It is a philosophy which is oriented to explaining the world in terms of the world itself, without unwarranted appeals to forces outside the world to explain the world. It considers empirical evidence and logical reasoning to be necessary to justify any belief. It takes account of the role of time and developmental process in constituting the world and ourselves as what we are and what we may yet be. It does not succumb to the temptation to think there can be any adequate explanation of a thing without a full realisation of its historicity.

It looks to the interrelatedness of things as essential to comprehending what they are and therefore seeks to put an end to the impoverishment of every discipline through its disconnectedness with other disciplines. It recognises the ascending levels of complexity in the organisation of matter and the emergence of novelty in the evolutionary process, such that each level is rooted in the preceding level without being reducible to it.

It is not a retreat to an undifferentiated unity, recognising always that specialisation has been necessary to the development of the sciences, but that overspecialisation must be transcended in a higher synthesis that gives full scope to both the relatedness and distinctness of the specific areas.

What this means, to take the example of psychology, is that psychology is distorted in so far as it is disconnected from the social sciences on the one hand and from the biological sciences on the other. There are certain crucial things about the human personality that cannot be understood without due reference to the social-cultural-economic context which decisively shapes its character or without adequate realisation of the neuro-physiological basis of behaviour. However, whereas psychologism will not do, neither will sociology or economism on the one hand nor biologism or physicalism on the other.

Each of the sciences needs to open out to the others and be revitalised and reconstructed in the interaction with the goal of integration of knowledge in view. One thing that is essential to the process is an integrative philosophy capable of encompassing all the sciences, all realms of knowledge, while giving each its due.

Will this happen? Unfortunately, I think not. There are and might be more enclaves of it, but it will not happen on the scale it should. It runs counter to the most powerful forces in the field – the imperatives of the global system itself with its agenda of intensifying commodification of knowledge and commercialisation of science, requiring ever greater specificity of outcomes without criticism, reflection or intellectual integration.

It is a central paradox of our times: never has there been such a totalising systematising force as contemporary global capitalism and yet never has there been such inhibition of synthesising systemic thinking. The centralising market decentres the psyche. It organises production and consumption, but disorganises community. Nevertheless, there is a seeking of truth, a striving for justice, that the system can neither satisfy nor suppress. In this I place my hope.

\* Helena Sheehan *Marxism and the Philosophy of Science: A Critical History* Humanities, Press International 1985, 1993. See <http://webpages.dcu.ie/~sheehan/mxphsc.htm>

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