

The Unity of Science

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This is a photo of a statue of an ancient thinker that I bought in a museum in Romania.

It was the image on the congress poster.

Philosophers, Scientists and the Unity of Science

The topic of the unity of science has something of a quaint air about it nowadays. Especially when the matter is raised by a philosopher, it is likely to conjure up all kinds of images from the past:

- ancient images of the Parmenidean One
- mediaeval images of Thomistic metaphysics reigning as queen of the sciences
- early 19th century images of the separate sciences as stages in the unfolding of the Hegelian Absolute Spirit
- turn-of-the-century images of Machian science as the most economical organisation of sensations, with metaphysics as the greatest danger to the unity of science
- early 20th century images of the stark anti-metaphysical zeal of the Vienna Circle for the unity of science movement resolutely reconstructing the sum of scientific knowledge on the model of a logical system of observation statements

Very diverse images, to be sure: both idealist and materialist; both metaphysical and anti-metaphysical; both phenomenalist and physicalist; but they all have in common an unmistakable quality of quaintness. We recognise the sincerity and human striving underlying them, of course, but a musty air clings to them all.

It was all such a long time ago and we are so much more sophisticated now. We have come such a long way. We have come to know just how problematic is our knowledge. We no longer entertain such bright

hopes for our science. We stand amidst the debris of discarded unities, the ruins of demolished systems. We do not talk nowadays about the unity of science.

But perhaps we should. Certainly, we should do something. We cannot go on pretending that all is well, chattering pleasantly about small and simple things, oblivious of the large and complex matters that are virtually crying out for our attention.

Of course, work is being done and progress is being made, certainly by scientists. 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?

But we really must know. We must know what are the implications of it all for forming a picture of what sort of a world it is in which we live and flutter about and what sort of creatures we are living and fluttering about in it.

But who is to know such things? And how? The scientists will say it is not their job. 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.

But if scientists cannot make any sense of it, then who can? Certainly the philosophers don't seem very promising candidates. They have retreated for the most part into the subdivisions of their own discipline, sometimes becoming more technical, sometimes becoming more fuzzy, but always becoming more insular. Most of them know almost nothing about science anyway, unlike philosophers of the past, who in other eras were undifferentiated from scientists.

Today's philosophers indeed seem singularly unfit for the job. When it comes to foundational tasks, and even more to constructive tasks, there is massive failure of nerve on the part of the philosophers. It has become so complicated to know what it is to know that philosophers despair of knowing and urge us all to renounce the notion of philosophy as a foundational discipline, much less a constructive one, and to just carry on the conversation that constitutes our culture.

It is tempting to acquiesce, so enormous are the problems and complications. But we must not, for the world cannot afford this epistemological paralysis, this ontological despair. If we must renounce the quest for certainty and settle for warranted assertibility, then let us do so. Warranted assertibility is no small thing, and, sadder but wiser, let us go on with it and let us assert.

Let us by all means take account of the problems and let us also take care to be clear about what it means to be "warranted". But, in doing so, let us remember that, however theory-laden our observations, past observations have been formative of our theories. Let us be aware that, however impossible it is to encounter such a thing as a "raw datum", our constitutive concepts had not emerged *ex nihilo*. They are the product of the active coping of our species with a reality irreducible to itself. Our ideas, at least our saner and more successful ones, bear always the impress both of ourselves and something beyond ourselves.

I know full well that I cannot solve here and now and for all times the problem of knowledge and that it is necessary to be far more precise about these matters. My purpose here is only to urge that we exert ourselves to overcome the present deadlock and move on.

But to what shall we move on? What can we really do about the escalating separatism of the sciences? Is the unity of the science in any case a legitimate and realisable goal? And, even if so, what part have philosophers to play in it?

The very idea of the unity of science, let us acknowledge it straight out, is grounded in the ontological assumption of the unity of the world. Philosophers here have a role to play in arguing over the legitimacy of such an assumption. For my part, I would argue that, while there are no knock-down, drag-out, non-question-begging proofs for our most fundamental ontological assumptions, we can nevertheless state why and how such assumptions are more warranted than any of the contending alternatives. In fact, all of us, at least those of us who pass as sane, to some extent do inevitably presuppose that reality is somehow one, for the very essence of what we call thinking is making connections, finding patterns, probing for unifying concepts.

Certainly in pursuing science, we presuppose a kind of unity of the world, for organising experiments and interpreting results rests on the assumption that the flow of events is structured, ordered, lawful. A random, disconnected, indeterminate universe could not be conceptualised. Indeed, it would not be a universe. However, we proceed, and we assume that what we are dealing with is in fact a *universe*; that, beneath all the complexity and diversity there is some sort of underlying unity.

Doing so has carried us through everything we have reason to call progress and it is reasonable for us to think that this reveals as much about the world as it does about us. My argument from here is that, if we are going to make such an assumption, it is better to do so clearly, consistently, and self-consciously than to be schizoid about it, as most philosophers these days are. To do so is to accept the legitimacy of the goal of a unified science.

As to its realisability, we may have no grounds for believing it to be realisable in the immediate future, given the unevenness of development that characterises the present state of the sciences, but this does not invalidate it as a goal that may be realised further into the future. It is not in principle unrealisable, and there is great heuristic value in postulating it consciously as a goal to be realised.

The barriers erected between the sciences are not insurmountable, but we must be convinced of this in order to begin to surmount them. And we must surmount them, for our progress in understanding the world and ourselves is being obstructed by them. 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.

But how can this state of affairs be overcome and by whom? The answer, I believe, is that the unity of science 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.

In pursuing the goal of a unified science, certain philosophical assumptions will block the view and obstruct the path. Others will illuminate the way and move the journey onwards.

On the one side, there is the continental hermeneutic tradition, perpetuating the neo-Kantian *Methodenstreit*, leaves an unbridgeable gap between *Naturwissenschaften* and *Kulturwissenschaften*, neglecting the natural for the sake of the human.

On the other side, there is the anglo-american positivist and tradition, which has pursued the ideal of a unified science, intending to leave no unbridgeable gaps, but its unity, whether of the phenomenalist or physicalist variety, has been of a highly reductionist sort, leaving us with a severely constricted framework, with no way of accounting for what is distinctively human. Either it must be left

unaccounted for or an account must be sought outside the boundaries of science. As the choice is often posed, we must either leave the sciences to go their separate ways or reduce all the rest to physics.

Other intellectual traditions, also part of continental or anglo-american intellectual history, such as marxism or pragmatism / radical empiricism / naturalism / process philosophy, point to more promising possibilities.

The choice between separatism or reductionism must be rejected. We can pursue the unity of science without adopting the reductionist model by opting for a philosophy of integrative levels. There is an optimal philosophy for achieving the unity of science. 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 scientific method to be all-encompassing, and leaves no part of reality untouched by science and beyond its boundaries, needing no *élan vital* or *Ground of Being* to be brought in to explain it. 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 construes the methodological relationship between the different sciences as parallel to the ontological relationship between the different levels of reality, with the various sciences emergent from each other thus:

social sciences

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psychology

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biology

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chemistry

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physics

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 socio-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.

My thesis then is that each of the science needs to open out to the others and be revitalised and reconstructed in the interaction, with the goal of the unity of science in view, and that one thing that is essential to the process is an integrative philosophy, a systemic world view, capable of encompassing all the sciences while giving each its due.

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