Daniel Paksi: *Personal Reality: The Emergentist Concept of Science , Evolution and Culture.* Two Volumes.
Eugene, OR, Pickwick Publications, 2019.

1. Overview

I found it difficult properly to review these two volumes, partly because there is so much of importance in both, and especially because I am not competent to review the numerous and strictly scientific contents. Hence I shall give a brief overview of the two volumes, some idea of the contents and structure. Next I shall add Dr David Jewson's review of the more scientific passages. He is a retired medical doctor who now studies physics as well as personalist philosophy. Finally I shall comment upon the more philosophical items.

These two volumes build upon and extend recent articles by the author in *Appraisal*, which to which I have responded. In brief, the author employs the philosophy of Michael Polanyi, which he summarises sufficiently for those new to Polanyi, and gives plenty of references to, and quotations from, mostly *Personal Knowledge*, and especially the final chapter, 'The Rise of Man'. He also employs contributions from Samuel Alexander and others, in order to explain how evolution has produced a multi-level universe culminating in the emergence of persons and their cultures.

Each volume has two parts. In Vol. 1 Paksi sets out the main themes and their basis in the philosophy of Polanyi, which he summarises as required, and in Vol. 2 he enlarges them.

In Vol. I. Pt 1, 'Personal knowledge', he shows the limits of Darwin's 'natural selection' and Neo-Darwinism, to account for the real emergence of higher and more complex levels or orders of reality, notably life which Darwin's theory presupposes. Our own emergence as intelligent beings is shown by the unspecifiable nature of our knowledge compared with the specifiability of our DNA, the incoherence of Laplace's universe with no one in it who could apprehend it, and the tacit roots of scientific discovery, doubt and our personal knowledge beliefs and commitments.

Randomness, on which Darwinians depend for the emergence of higher orders, is the effect of the deterministic material upon an existing higher order, and so it can account for breakdowns and in a higher order and eventually its destruction. A higher order is an unspecifiable whole resting upon and harnessing its specifiable parts.

Pt 2, 'Emergence' is a more detailed examination of emergence and accounts of it, its relations to reduction and materialism. Emergence results in two different kinds of reality but only on one multi-level entity, and not a dualism of two entities. 'Weak' or 'epistemological' reduction (that higher levels can be explain by the concepts and categories of lower ones) entails materialism, and both require a *person* to perform and believe in them. The difficult (for me) Chap. 6 on the roles of space, time and matter, I shall leave to Dr Jewson and to a comment at the end. Boundary conditions, the limits within which a process operates, are used by Polanyi's and Paksi's to explain the action of a higher level upon a lower. A piece of wood leaves open many ways in which it can be shaped and the uses to which it can be put, and bars others, as by the greater weakness if shaped across and not with the grain (my example). Paksi applies this conception to the natural sciences and engineering. (It can also be applied to personal life: good manners and moral laws set limits to what we can think, say and do; grammar sets limits to the construction of meaningful sentences.) Time is real, and the proper answer to dualism and vitalism is the 'diachronic reduction' of tracing emergence back to its origins. What higher levels depend upon has to emerge after the lower and they in due turn.

Vol. 2. Pt 3 'Evolution'. begins with Polanyi on 'The Logic of Achievement' in all forms and levels of life and machines, plus Paksi's own addition of computers. What distinguishes all of them is that they manifest 'rules of rightness', which are formulations of their success or failure, health or disease, life or death, the correct or impaired or total failure of their operations. These are the emergent 'ordering principles' of all levels above that of the physical. Thus the study of them requires evaluation of the success or failure, health of disease, etc., of entities and processes on those levels. The emergence of personal knowledge (and the subpersonal knowledge of animals) can be understood only by our use of our own personal knowledge and its tacit and unspecifiable roots, and not by the specifiable measurements of the physical sciences nor Darwinian natural selection. Likewise cultural

evolution and transmission, cultural organisations and their emergence, individuals, groups and persons, and writing as a recording and transmitting system, have be understood in the same way.

Part 4, 'Personal Reality', starts with examination of scientific revaluations, evolutionary views of science, relativism or absolutism, personal knowledge and truth and demolished idols, and proceeds to moral and intellectual reality, with reference to Polanyi on modern dynamic societies, Marxism, moral inversion and its spurious and new forms. Finally, Paksi considers the future of personal reality with respect to truth and morality, God and matter, evolution and emergence, science and wisdom, and a general conclusion.

There is much detailed examination and development of the matters discussed, and which I cannot mention or comment upon here.

2. The scientific aspects

I have been asked by Richard Allen to review the scientific parts of Daniel Paksi's book as I am both a Personalist philosopher and have a particular and deep interest in physics, but like Polanyi, I am a medical doctor and not a physicist. I am, therefore, going to concentrate on Chapter 6 of Volume 1: 'Space, Time and Matter', although a lot of the concepts in this chapter are explained or discussed in other chapters as well. This might seem a rather confined approach, however, the key theme of the book is to do with time and space, and so to understand this chapter helps to understand the whole book.

I have been particularly pleased to do this as I soon discovered a lot in common between what both Daniel Paksi and I find interesting and indeed what we both see as solutions to the real conundrum about how Nature (the world, reality, physics) is actually working. I apologise for the length of this review, but I couldn't say what I wanted in a shorter space.

Perhaps the first thing to say is that there are a huge number of ideas in this book crammed into a very small space. Daniel Paksi clearly loves ideas and has tried to build a very comprehensive picture, but that makes it hard to review as a thorough review on its own would take another book. Philosophers will also struggle with a lot of it as, in order to be concise, Paksi uses a lot of scientific jargon. So, although, for example, I understand the Lorentz transformation, a lot of philosophers would not and, due to the density of rather technical physics, many would give up almost before they began which is a shame because the main ideas are well worth getting to grips with. So, one of the main ideas is that Nature (the world, reality, physics) is emergent. This is an absolutely lovely idea. I think it means that if you take some very simple things and apply simple rules to them you can get some very complicated things. So, if you were to take lots of identical Lego bricks, which have some very simple rules about how they can be attached together, you can make some very complicated things, like, for instance, a giant model of a giraffe in a park. People might wander past that giant model for years and never realise that it was made of Lego bricks or that such simple rules for connecting Lego bricks together could make such a complicated thing. One might then draw a parallel with how Nature (the world, reality, physics) is actually working by wondering if all the beautiful complexity we see actually comes from something simple. The nice thing about this idea is that if you did find that simplicity it would be quite easy to prove that you were right by, for example, programming a computer with those simple ideas and rules (and those simple ideas and rules alone), setting it going and seeing if it came up with the complexity of Nature exactly as it is. Now with most scientific theories it is easy to bodge them to make them fit the facts by adding exceptions and working around etc. so, essentially by making your theory more complicated. But if you are only allowed only a few simple ideas and rules which are then to be repeatedly applied to produce Nature, you can make your theory more complicated so you can do the bodging. Also if you did want to bodge a rule to try to make your theory fit a particular thing you found Nature, as that same rule would be applied many times and affect all parts of Nature, you might find your change had fixed the thing you wanted it to, but caused a multitude of things that didn't fit in all the other parts of Nature. So, the idea of emergence is well worth exploring.

As a Personalist there are some other ideas that I find attractive and I mention them here only as a way that I can personally judge Paksi's book by comparison. So, I experience the world. I experience time and I experience space, but I experience them as different things. Rather than 'time' it might be

better to say 'change' and therefore not to say 'time passes' but to say 'things change' I also experience lots of other things such as different colours, for example. I can imagine things happening and my imagination uses the same things as I experience in the real world, e.g. space, change and colour. So the ideal description or theory of the world would, for me, consist of the same things. To perhaps put it more simply, if you have a good theory of the world you need to be able to imagine exactly what is going on. No theory of physics has every managed to do this, although people keep trying. To understand why this has been such a big problem it is useful to think about some of the very strange basic things physicists have discovered about the world so far:

1. When trying to predict what small things like atoms do, it seems you can only give probabilities about what will happen. A way of being exact has not so far been found. Why should this be? A lot of small things seem to occur in packets, so, for example, light seems to be divided up into little packets of energy. Why should this be?
2. There are good ways of predicting what small things (like light packets) will do, but these involve rather strange and bizarre ways of working things out that don't seem connected to reality at all. Let me give you a flavour of this. So one way you can work out where small things might go is by drawing lots of waves. I wont go into how exactly how to do this, but it depends on the fact that waves can either add together (two crests add together to make a large crest) or can cancel out (a crest added to a trough makes nothing), so if you have an area full of lots of waves there will be some places where there are large waves (where all the crests are added together) and other places where there are no waves (crests cancel out a troughs) and you can see this with water waves, say on the surface of a pond (you need to throw several pebbles into the pond at the same time to get several waves that can mix). So, as I say, you use these waves to predict where small things will go, and the answer is they are more likely to go where waves are large. Rather surprisingly this works very well, but these waves are not real, they are just drawings, and if the drawings do represent something real there is no explanation as to where these waves come from, what they actually are or why this barmy method of adding waves together works. So you start with small things, which are easy to imagine, but then you have to add in some barmy method of working out where they go. That is why physicists will also say they don't understand it. They mean they have a barmy process they can use to predict what will happen but have no idea why it works. This frustrates many of them as much as it frustrates philosophers.
3. When something, like a pocket watch, for example, is given energy by being thrown, it starts to move. But it will also start to tick more slowly, and so run slow (whatever mechanism it has), and it will also shrink to be slightly smaller. Even more oddly gravity causes exactly the same effects, so a watch will tick more slowly on the surface of the earth, where gravity is strong, than when it is in space well away from Earth, where there is no noticeable gravity and again this happens whatever type of mechanism it has to make it tick. This all has the rather unfortunate consequence that if different people, who are travelling at different speeds (or experiencing different amounts of gravity), make measurements, they will all disagree because their watches are running at different rates and their measuring sticks have shrunk by different amounts, and it is difficult to say who is right. They do, however, all agree on the speed of light and that, as something approaches the speed of light, more and more energy is needed to get it to go any faster, so it is actually impossible for it to reach light speed as it would take an infinite amount of energy to get there.

Paksi is clearly undaunted by this task and starts by deciding what fundamentals of our experience should form the basic elements of a theory of reality. Following Samuel Alexander he decides to choose space and change (time). This seems a big ask, but actually I think it could work. Other personalist philosophers like Austin Farrer have had similar ideas. Farrer, I believe, linked existence to action which is much the same as linking existence to change. I won't go into the details of how Paksi puts it all together, which is rather complicated, but I might present something which I am guessing is similar to what Paksi is saying:

Consider Space and then imagine at every point in space there is a number and this number is constantly changing. It would be like a vast sea of changing numbers, each number being at a fixed point. Also imagine that one changing number can affect its neighbours and that there are simple rules that govern how this happens and that this influencing of one point of space upon another spreads throughout the system at one fixed speed. This could produce an interesting sea of interlinked

constantly changing things, and you might say that this could model the world, as the world is nothing more than a sea of interlinked changing things, but then this is hardly our personal experience of the world. We don't experience numbers, we experience things. Where, for example, do things like the colour red come in? So, in physics red light can be thought of as a wave which means it can be represented by a number that goes up and down repeatedly at a particular rate (just like waves go up and down at a particular rate). Red at a particular point in space could then be represented by a changing number that cycles up and down. Hey, Presto! This means all our changing numbers could be transformed into things that we personally experience, or, to put it another way, those changing numbers are a code for something we do personally experience.

So space and change alone could describe Nature. But, rather paradoxically this gives a world that can both be described very simply using space and change, but is also very complicated as each changing number can be decoded into what is really experienced. There is clearly an infinite number of rates at which a number can change and therefore an infinite number of experiences (the colour red being one of them) that those changing numbers can describe.

So does Paksi succeed? Well, given the fundamental rules that he starts with and nothing else, I'm not sure a computer applying those ideas repeatedly would actually come up with a world that includes all the oddities listed above, one reason being that the rules are not very clear or detailed. Also the link between the theory and real experiences, such as the colour red, is not a major focus of the theory, indeed I'm not sure it appears at all.

Paksi also, quite naturally, seems keen to make his theory fit in with Einstein's ideas. I prefer to think that Einstein was really struggling with the implications of his theory and never found a satisfactory explanation for them. For example, although, probably in the minority of one, I find it difficult to agree that speed is only relative to other moving objects. This is not some reactionary longing for classical physics but paradoxically from Einstein's own theory. So, if we were all travelling at different speeds and all carrying identical watches, then, according to Einstein's theory, the watches would all run at different rates. We could then tell who was travelling at the slowest speed by whose watch was ticking the fastest.

In the above model I gave of Space filled with fixed points with a changing number at each point, there is clearly a fixed grid of points, so something against which to judge speed, and then the values at each point can influence their neighbours (increase or decrease how fast they are changing), so that influence can move across points in space, but at only at the same, single speed. A water wave is similar in that water moves up and down where a water wave starts and that moving water influences the water next to it and so on and the wave spreads out at a single speed. In Einstein's universe there are many speeds but speed is relative to other objects in the universe that are not fixed; in contrast, in the universe I put forward above there is only a single speed, and that speed is relative to a fixed background.

My own hope would be that all the odd things that are currently explained by Einstein's theory would actually emerge naturally from a very simple set of rules about how things change in Space, repeatedly applied and so Einstein's view of things, along with complicated concepts like space-time, would no longer be necessary.

So, in summary, well done Daniel Paksi. I really think your basic ideas about each of us having a personal reality and that that reality emerges from space, change and a set of very simple rules is interesting, thought provoking and could well be spot-on. I would say the details do need some considerable re-crafting and development, but that it is such challenges that make philosophy itself worthwhile.

3. Philosophical aspects

First, a minor discomfort: I think that 'evolution' is not an apt term for the rise and history of human cultures and civilisations, because it suggests that they are continuous with the emergence of the non-personal levels, and thus are the results of impersonal forces, whereas human life and its histories are the more-or-less intended or unintended results of human discoveries, efforts, plans, mutual self-adjustments and creations.

Now for the really important items. Paksi follows Polanyi in rightly insisting that radically new orders and levels of reality have come into existence, especially those of life, then perception and

intelligence, and finally that of self-responsible persons. Again, he is rightly critical of Darwin and Darwinism which can only explain the micro-evolution of changes within species, and not the macro-evolution of new orders or levels. In any case, 'natural selection', like the *'*artificial selection' of plant and animal breeders, can *'*select' only from what exists. Hence it is explicitly a theory of survival and extinction, and not of how something quite new comes into existence. That Neo-Darwinism assigns to the random mutation of genes. But how have genes emerged? As Paksi rightly says, Darwinism presupposes life and cannot account for its emergence. Again, he rightly argues that evolution presupposes the reality of time and thus the 'diachronic reduction' of tracing the stages of emergent entities back to their physical source (But is that a confusing new use of 'reduction'?), whereas the *'*synchronic reductions*'* of materialism deny its reality. But, surely, the physical level of the universe is also constantly in motion and undergoing changes. Moreover while the equations measuring its processes can be reversed, there are innumerable processes that cannot be reversed: splashes of liquids, diffusion of energy, heat and light, all biological processes especially those from life to death. It is only an infatuation with mathematics that leads the deniers of irreversible change and time to ignore the realities of the world around them and their own life experiences.

But he does not deal or even mention the serious and evidenced arguments that higher levels and new forms within them do not evolve from lower or previous ones, such as land animals from marine ones and homo sapiens from earlier hominds. Rather, throughout he takes the fact of continuous evolution for granted.

Paksi also rightly rejects the substitution of mathematics for the realities it is used to measure. But at this point (Vol. I, Chap. 6, 'Space, Time and Matter'), Paksi, having rightly rejected, with Einstein, Newton*'*s absolute Time and Space (a pre-existing cosmic grid) then invokes Samuel Alexander's reinstatement of their pre-existence, but with Time, as a successive whole, irreversible, transitive and ordering, and possible only in Space. Although he recognises that both are conceptual abstractions, he then follows Alexander in treating them, not only as entities, but also as active agents, each making the other possible: time makes a three-dimensional space possible and only space can make time manifest itself. Space is therefore the lower-level condition of the emergent higher level of Time. To be frank, this looks like a combination of a mythology of the old all-inclusive and self-generating cosmos and of the Hegelian trick of turning logical relations into real and causative ones. It really ought to be demythologised. Also, though Polanyi did mention it (with respect to equipotentiality, when one part of an organism takes over the operations of another but defective or absent one, *Personal Knowledge*, pp. 337ff.), events on higher levels can disturb the operations of lower ones, as when chronic worry can cause stomach ulcers. It also means that randomness can occur even in the lowest level, and therefore that all levels are *'*open*'* ones and none are wholly deterministic and therefore not completely closed, contrary to what Paksi claims in Vol. Chap. 4.4.

I now come to the central question of what brings into existence all the novel higher levels, each with its own autonomous *'*operation principles' and *'*rules of rightness'. The whole point of the refutation of scientistic reductionism is that the operations of any lower level cannot account for the emergence and operations of the next higher level, though, as Paksi and Polanyi rightly show, they can account for disruptions and breakdowns in and of them, as certain drugs disturb our mental operations while others can prove fatal. Therefore how can their existence and autonomous operations be explained? Every theory of evolution has to answer this question. But purely intramundane attempts fail to do so in one way or another. Some frequently used pseudo-explanations are: to deny that emergence and higher levels do not exist; to hold that they can be explained by those of the physical level; to use equivocal words such as 'élan vital', 'nisus', 'feeling' and 'decision' across the levels of existence; or say it happens slowly as if yet more of the same at longer intervals could amount to something radically new.[1]

At this crucial point Polanyi and Paksi, being determined to avoid any divine creation and intervention, and, in Paksi*'*s case also to avoid any 'dualism' of body and soul while allowing that both exist, resort to claiming that the operation principles of each level bring those levels into existence![2] Nor, as already mentioned, can Alexander's Space and Time create each other, nor can Stephen Hawking's 'law of gravity' create the universe,[3] let alone do so necessarily. But operational principles, like the laws of nature are not entities, let alone causative agents, but are human

formulations of actual relations among real entities, which do not 'obey' them nor are 'governed' by them. Such talk needs to be recognised as the anthropomorphism that it is, as does the 'harnessing' of lower levels by the higher. Instead a clear recognition of the daily facts of 'downwards causation', as I now compose this review, is needed. Frankly, I am surprised that the lengths to which very clever people can go to avoid questions about the absolute presuppositions to which they cling at all costs, and am pained that Polanyi, of all people, should do so, in spite of everything he rightly says about the reality, distinctiveness and autonomy of higher levels. The only coherent conclusion is that they cannot 'emerge' at all from the existing ones, and thus only an extramundane and creative agent can bring about a genuinely multilevel universe.

Richard Allen and David Jewson