



Science and The Human Person

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Hardly anyone speaks of the soul any more. Cartesian dualism – alleged to be the view that the soul is a thing that thinks, and is quite distinct from the body – is often only mentioned as an object of derision. It is often taken for granted that the soul has been displaced by the mind, and the mind is just a by-product of the workings of the brain. Is it still possible to speak of the soul in a scientific world?

I shall argue that it is. By that I mean that what is distinctive of human persons (and of any other persons there might be in the universe) is a non-material component that we may term a 'soul' or 'self' or 'subject of experience and action'. I use these terms interchangeably. I shall argue that the self can be disentangled from its material embodiment, then that is what gives each person a unique individuality and that it is what makes immortality possible. And I shall argue that this view is entirely in agreement with the best contemporary science.

To begin with, anyone who believes in God must believe there is an active consciousness that does not depend on matter – that is what God is. If mind has ontological and causal priority over matter in this way, then it is unlikely that finite minds should be wholly dependent upon and caused by the material universe. Believers in God must be predisposed to believe in a soul, in some sense. Yet it also seems unsatisfactory that minds should be just injected into the physical universe at certain points, like alien beings in an otherwise continuous and gradually developing process. How can it be that finite minds seem to emerge from physical evolution, and yet seem to be different in kind from matter?

I think a clue to understanding this is provided by the fact that consciousness requires objects to apprehend, and, as some interpretations of quantum physics suggest, objects are precisely objects-for-consciousness, not realities that exist entirely in their own right. So neither consciousness nor physical objects can exist in isolation.

This hypothesis is in complete opposition to the materialism that is often thought to be an implication of modern science and philosophy. But in my last lecture I argued that quantum physics undermines materialism, and that it queries the very concept of 'matter' as a basic explanatory tool. Further, it seems to show that consciousness is necessary to the existence of the world as it appears to us. It is false to think that modern science is materialistic, and Paul Davies and John Gribbin have even written a book on modern science called 'The Matter Myth' (Viking 1991). Consciousness may be an ultimate constituent of reality, and different sorts of objects provide the contents of consciousness.

We might see finite persons, including human persons, as both objects of divine consciousness and subjects of distinctive perspectives on the world. They have their own unique point of view from which they see things, and their experience is different from that of any other being. They have their own distinctive modes of creative action in the world. They respond and react to things in ways that express their own distinctive characters and experiences. They have their own unique ways of relating to other subjects within the world, so that they form a community of persons, related to each other in many complex and changing ways.

These subjects are essentially embedded in the world, which provides the objects of their knowledge and response, and the environment of their actions. They are not independently existing pure spirits, but parts of an objective physical world (the world of objects-to-God) within which they have their own subjectivity. So the objective world must be a suitable home for such unique subjects. In its gradual development over

billions of years of complex organic structures with a huge degree of integration, of bodies with central nervous systems and brains, the physical world comes to be an appropriate home for many kinds of finite subjectivity.

This universe is one that generates conscious subjects by a long process of development. These subjects develop from simple elements of matter, and they remain wedded to the material elements that form their basic structure. The sorts of experiences they have, the sorts of things they can do, and the sorts of relationship they can have with others, all depend on the structure of the physical universe of which they are part. Like God, they are conscious subjects. Unlike God, they are many, dependent and developing. In and through them, the physical world of objects becomes transformed into a world of subjects, conscious, intelligent, free and responsible.

In any explanation of the universe, the evolution of conscious subjects from a purely physical cosmos must play a major role. I consider that some form of an Idealist view offers the best prospect for an adequate explanation. One such explanation would be that an ultimate subject of consciousness brings into existence, out of the infinite reservoir of possibilities inherent in its own nature, a spacetime universe that develops more and more complex and organised forms. Eventually, the universe generates out of itself, in accordance with principles that have always been embryonically present, innumerable finite conscious subjects that can experience and shape the universe from within. Thus the one primordial self is reflected and expressed in many partial forms in the physical world. The ultimate goal of this process might be that the many conscious subjects should somehow be re-integrated with the divine originator of the process. All their diverse experiences and actions might be embraced by ultimate mind, and ultimate mind could then be said to have completed its own creative journey into the finite and the physical.

Those who are familiar with the work of the German philosopher Hegel will find an echo of his extremely ambitious system here. But it is not purely armchair speculation. It is an attempt to take seriously the findings of the best modern science, and see what sort of ultimate explanation of the universe they might suggest. Any attempted synthesis of this sort will be contentious, and some might say it is premature, that we do not have enough knowledge to justify it as yet. I think we can say, however, that it is at least as well substantiated by the sciences as is materialism, its chief competitor. And if bold hypotheses were not attempted, science would never have progressed. So, making due allowance for its objective uncertainty and provisionality, this sort of explanation seems to me to offer the consilience of personal and scientific explanation and the integration of many diverse data within one coherent framework that a truly ultimate explanation requires.

One view that is excluded by this approach is extreme dualism, which makes mind and matter completely different from and independent of each other, and sometimes laments their combination. Such a dualism is found in Plato, but there are occasional glimpses of it in Descartes - who, however, most of the time had a fairly orthodox Catholic and Aristotelian view of mind and matter as closely integrated.

Another excluded view is reductive monism, whether material or spiritual, which either reduces mind to matter, so that consciousness does not exist, or absorbs matter into mind, so that the material world is seen as illusory. Materialist monism is rarely found among the classical philosophers, who tended to take it as obvious that the data of consciousness are real and not extended in public space. But it has formidable defenders at the present time, and some neuroscientists take materialism for granted.

This is because knowledge of the brain has increased enormously in the last century. We can scan the brain to locate which areas of it are active when different mental activities are being undertaken. We can observe differences in behaviour and perception when parts of the brain are inactive or even absent. All evidence suggests that the sort of consciousness a person has depends on the functioning of the brain. Benjamin Libet claims to have shown by experimental investigation that even the initiation of voluntary action shows up as a 'readiness potential' in brain activity, before an agent is conscious of making a voluntary choice. This suggests that it is not really the agent initiating an action. It is the brain that really causes action, and the consciousness of 'acting' is an effect of prior brain activity. These findings are still controversial, and Libet himself believes that voluntary actions can still be modified or even blocked by a free decision of the agent (he accepts the existence of radical freedom). But the accumulation of data like this from the neuro-sciences leads many to believe that the physical brain is the real cause of all actions, and that consciousness is just a by-product of brain activity.

At its most extreme consciousness is said, by reductive materialists like Francis Crick, to be nothing but physical brain changes. That position, however, is so counter-intuitive that while it has impressed many by its technical sophistication, it has convinced few. Most of us are more certain of our immediate experience

of being conscious than we are of highly technical philosophical theories that claim to show that consciousness is an illusion. The brain sciences certainly make us much more aware of the importance and complexity of the physical brain in influencing and constraining conscious experience and action. But to most conscious people it still seems that consciousness is a real and distinct form of existence, and essentially consists in a form of subjectivity that cannot itself be perceived directly as an object.

Each of us has sensations, thoughts and feelings of which we are directly aware, but which are not accessible in the same way to anyone else. In knowing this, we are aware of our own subjectivity. But that subjectivity is not isolated and cut off from everything else, as though it was imprisoned in its own solitude. It is inwardly oriented to, and requires the existence of, objects in a material world, for the subject of experience to have content. We might say that all objectivity is FOR a subject (whether that subject is God or a finite being); and all awareness is OF objects (whether they are conceptual, mental or physical). In the case we know best, the human case, the content is provided by the physical world, but a unique and distinctive perspective on that world and a creative form of action within that world is made possible by a personal subject of experience and action.

Those who believe that all conscious states are simply the effects of physical brain states tend to deny that a human person is just one personal subject of experience and action. Different parts of the brain are responsible for different parts of our conscious experience, and there is no immaterial 'self' or subject that somehow controls, supervises and integrates them all. Studies of people with brain lesions or abnormalities show that there are many diverse sources of causality in the brain, and they may easily fall apart. For example, some patients whose left brain hemisphere has been surgically separated from their right brain say they cannot see a dart board placed before them. But they can nevertheless throw darts at it with a fair degree of accuracy. It seems as if different parts of the brain (in this case, visual and motor) act independently, and we are just lucky they co-operate as much as they do. The self is dissolved into many different physical causes of experience and action. In fact the idea of one continuing conscious subject is an illusion.

I think it is fair to say that the neuro-sciences are still in their infancy. Knowledge of the working of the brain has contributed hugely to our understanding of the human person, and of the nature of mental activity. But denial of a conscious self seems rather to be based on a dogmatic denial that there is any non-material aspect to human persons. This results in the assertion that there is nowhere a 'self' could be. There is no physical part of the brain that can be identified with a 'self'. This is a materialist version of David Hume's eighteenth century assertion that, when he looked into himself, he could find no such thing as a self.

That is hardly surprising. The self, if it is a subject of experience, is not an object that could either be observed or located among physical objects, of which the brain is composed. If we are to think of a self or subject, it is essential to distinguish clearly the ideas of subject and object. Objects are the contents of conscious experience; subjects are active agents who are aware of objects, and can act upon them. Some philosophers would recommend that we speak only of successions of experiences, that we do not need to speak of any subject that has experiences. However, we speak of such mental activities as remembering, thinking, concentrating and imagining. These are precisely activities, not a passive registering of experiences. The reason for speaking of a subject-self is that we need an agent of our mental acts - and even observing something fairly passively is an activity. The self is the agent who actively binds past, present and future experiences together as experiences of one consciousness.

The topics of mind, brain, consciousness and the existence of a self are among the most hotly disputed topics in philosophy. No view has commanded the assent of all informed participants in such discussions. The most I can hope to do is to set out some main alternative positions, in order to locate the view I am taking of consciousness on the conceptual map. The brain sciences have provided much new information on the causes, structure and limits of mental life. They have, I think, succeeded in showing that a radical dualism of mind and brain is implausible, given the very close dependence of personality and mental activity on the physical brain. They have not succeeded in showing that mental events are nothing but brain events, or that mental events are wholly caused by brain events. The way is open to posit a non-physical aspect to personal existence, and to speak of a subject or self who is the active agent in all conscious experience and voluntary action.

There are many pathologies of the self, many ways in which it can be disabled or fragmented by brain malfunctions. But the properly functioning subject is, and knows itself to be, one self who grows in knowledge and understanding, accumulates many sorts of experience, builds them into a unique unity of consciousness, and at least sometimes acts freely and responsibly on the basis of that unique experience.

Finite personal subjects come to exist as integral parts of the total physical reality that is our universe. They can only exist in a physical environment that is prepared for them, and that provides the possibility for a specific point of view and locus of action – that is to say, in an organic body in a social context with a well-developed central nervous system and array of sense-organs. When such an environment comes to exist, a conscious subject naturally arises – somewhat as the basic forces of nature come into being in a specific situation micro-seconds after the Big Bang.

Since subjects are different in being from objects, this could be called a form of duality, but it is a duality in which each part is necessary to the other. The misleading aspect of Cartesian dualism is that, in thinking of two seemingly distinct substances, it gives rise to the belief that the two substances, mind and matter, can very well exist on their own, and their unity becomes a puzzle. Indeed, Descartes believed that animals were unconscious machines without mind, and that minds could exist wholly without bodies (at least he imagined that they could, though I doubt he actually believed they did).

That is why it may be helpful to think, not of mind and matter, but of subjects and objects, where subjects are not themselves physical, but require the physical world, or something very like it, to exist, and where objects exist as objects-for-consciousness (primarily the consciousness of God, the primordial subject), not as primary and independent entities with their own inherent and mind-independent properties.

What is required, and what much recent work in neuro-science has begun to explore (though it is sometimes hampered by the influence of reductive materialism), is an investigation into the way in which consciousness and materiality are tied together into a unity in which neither loses its distinctiveness, and yet they are not two quite independent sorts of entity. Subjectivity is not an ‘entity’ alongside others. At least in the case of physically embodied subjects, it is what may be called the ‘interiority’ of the physical, what it feels like to be an entity that appears to other subjects as a material object.

We might think that all entities have a subjective and an objective pole. The subjective pole is what it is like to be an entity. The objective pole is what an entity looks like to others. These are tied together, since no finite entity exists without appearing to others – at least to God, the ultimate subject. And no appearances can exist without something that appears, something with its own character and set of potentialities. Everything that has independent existence has a subjective pole, but of course it does not have consciousness. Consciousness arises as a fairly high level actualisation of the inwardness of active, dynamic, entities in systematic interaction with one another.

All entities, from the smallest subatomic particle to the complex systems of events that constitute brains, are sensitive to their environment. All respond to stimuli by active behaviour, switching on properties in response to the context in which they exist – as organic cells in the human body switch on specific developmental programmes according to how they relate to other cells in an organism. All seek or avoid stimuli ‘felt’ as good (desirable) or bad (undesirable). Such ‘feelings’ are the inner states of either momentary events or the complex systems of events that form organic unities, like large molecules or the bodies of plants and animals. All such states develop in accordance with principles inherent in them, and most of those principles only become apparent when complex systems of events come into being. All have the capacity co-operatively to form successively higher patterns of complex unity that actualise new powers and new grades of inwardness. These four characteristics, of sensitivity to environment, reaction or inner adjustment to sensed stimuli, dynamic response and tendency to interact with others to form ever more complex unities, constitute the entities of which the cosmos is composed.

Rather than thinking of mind as a novel and entirely different sort of being that is introduced into matter at a specific stage, we might think of consciousness as a higher level actualisation of the primal sensitivity, active response and interactive self-organisation that characterise all the fundamental entities of which the cosmos is composed, in addition to their ‘material’ properties of mass, position and momentum.

Complex entities develop from simpler reactions and responses to a wider environment that ‘selects’ some forms for further development. In this way we could see consciousness as part of a continuum that progresses from the simple momentary unconscious sensitivities and responses of the fundamental events that lie at the basis of the material world, to the extremely complex inner states of organised spatio-temporally extended systems of events that characterise human organisms and brains – and perhaps to forms of life we cannot yet imagine.

The physical world divides into the phenomenal – the appearances of solid coloured three dimensional objects that constitute the world as it appears to us – and the inner states of complex and dynamic systems of events like animal and human brains. Some of these are conscious states, and some develop that sense

of temporal continuity and self-awareness that leads us to speak of a 'self'. Further, the fact of entanglement or interconnectedness, of which quantum theory makes us aware, suggests that such systems are not built out of simple independent atomic events. Rather, a system is an interconnected set of events, such that the whole system constrains, without totally determining, the behaviour of its constituent events.

Building on these perspectives, we might think that subjectivity is built into the structure of the physical from the first, but develops towards conscious response to stimuli and then towards self-awareness and intentional action as the interconnected, dynamic and developing physical structures of the universe grow more complex.

The picture is that finite consciousness is not a sudden unexpected intrusion into a universe that has been purely material up until that moment. It is a development of properties that have been potential in the material universe from the first, but that only gradually unfold as material systems grow more complex and organised.

Such a scheme builds conscious subjectivity into the universe in a more integral way than Cartesian dualism seems to do. It is not a form of materialism, for it affirms the existence of phenomenal properties, of intentional causality, and of emerging purpose and value, as real constituents of the universe. Nor is it a form of reductive idealism, for it affirms the independent reality of the physical, which provides the content for embodied minds, and whose emergent development lays down the causal parameters of knowledge and action. The existence of conscious selves can be seen as a fairly high level stage in the development of the inner states of complex systems of events, systems in responsive and dynamic interaction with the total environment of the cosmos.

Quantum theory suggests that through observation and experiment we can only know things as they appear to consciousnesses like ours. Perhaps the way things really are is as much mind-like as matter-like. That is, the independent reality that things in the universe have is one for which there is some analogy - remote at first but increasingly like the human as we ascend the scale of complexity - to perception of environment, subjective reaction, and creative response, together with sensitivity to the environmental structures of which those things are part.

On this view, even the simplest object has some minimal inwardness and potency, though it is not conscious and it will be just about completely constrained by the laws and powers of its environment.

At a higher level there will be some sensitivity to external influence, and some form of primitive response, perhaps of growth or reproduction. Plants feel the sun; they move towards the sun. But this is a matter of physical stimulus and response. It is misleading to think at this stage of inner feeling or intentional movement.

As physical structures get more complex, and central nervous systems and primitive brains form, rudimentary consciousness of the environment arises. Environmental stimuli are apprehended as qualia (phenomenally cognised properties or states). The simplest conscious subjects probably just register colours, shapes, and smells in a particular space, as they are provided by their sensory receptors and processing unit (the brain). They may feel pleasure or pain, and act to seek pleasure and avoid pain, in very limited ways. They have no sense of continuance, but are momentary.

Momentary feeling-states and reactions are new sorts of reality, elementary and momentary subjective states, 'sparks of consciousness'. They build upon and develop the existing physical sensitive-reactive system in new ways. In that sense they can be called emergent phenomena.

Such elementary subjective states can be connected up in a series where past states enter into the interpretation of present states, and look towards a future. At first this may still be a series of short chains of thoughts, feelings, sensations, and percepts. There need be no sense of responsible action, no abstract reflection, no imagination free from sensory presence, no calculation of the thoughts and feelings of others (and so no sense of personal relationship). This is a primitive sense of continuing self and responsibility, without clear awareness of it, or a strong sense of personal identity – probably most higher mammals possess this form of consciousness.

A further stage in development is characteristic of humans. It involves a degree of responsible self-shaping and free conceptual thought. Language seems to be essential at this stage. There arises a sense of moral community, and a sense of continuing self.

At this stage there is a reflective use of the past to interpret present experiences, to classify and recognise them. Present experiences are evaluated as desirable or undesirable, to be sought or avoided. There arises the anticipation of future experiences, and propensities to respond are given direction in accordance with what is desired for the future. The physical lays the basis for these feelings and acts. But now organisms may feel the physical stimulus, registering its quality and intensity. They may act by modifying their natural physical responses, formulating a goal that may orient them more exactly. So a continuity of experience and agency arises, for which there is an idea of one continuous experience, the past interpreting the present, and giving rise to the goal-directed realisation of future states. This continuity is not necessarily temporally continuous. There can be breaks, as long as the past is used to interpret the present and the present is used to anticipate the future, so that there is a chain of experiences, connected by memory and anticipation.

There could be transient unities existing only for a moment, then vanishing. There could be short lived, intermittent or divided unities – short snatches of memory, mixed with error, so that the subject-self that unites experiences into one would be forgetful and inconsistent in goal-directed action. These would be imperfect unities, with little or no sense of continuity, no sense of continuing self. But the ideal unity of consciousness would be a comprehensive, complete and wholly understood set of experiences, connected by perfect memory and anticipation, perfectly controlled in action, always seeking coherent and clearly conceived goals. This may occasionally exist among humans, but not very often. It is a state largely yet to be attained, but a possible one for human beings.

The unitary identity of consciousness is thus a matter of degree. We have experiences, but do not fully understand them. We remember, but forget much. We anticipate obscurely and act indecisively and with incompatible goals. Still, we have a sense of a continuing and more or less responsible self, with experiences we can remember and past actions that have partly shaped us and our dispositions. This is the stage at which it is possible to speak of a distinct kind of subject of experience and action, not necessarily confined to members of the human species, but marking off a distinctive class of persons. Such a subject of experience and action is what has, in traditions influenced by Aristotle, been called an 'intellectual soul'.

According to this evolutionary story, the intellectual soul is in a continuous line of development from the simplest physical particles. It is the inwardness of complex integrated systems of events. But though there is continuity in the development of such systems, there are also crucial phase changes in the process. An example of a phase change is the change from liquid water to steam, as the temperature gradually rises, and the change to ice as temperature falls. The rise or fall of temperature is continuous and gradual, but at crucial points there is a sudden transformation of matter into a different state.

In the process of cosmic evolution, there are four particularly important phase changes in the structure of matter. First there is the point at which the dynamic and momentary fluctuations of fundamental particle/waves stabilise into more enduring atomic structures, and the chemical elements of the periodic table establish new patterns of interaction. Second is the formation of macro-molecules like RNA and DNA that can replicate and instruct proteins to build organic carbon-based bodies. Third is the genesis of consciousness, as central nervous systems emerge within organic life forms. And fourth is the emergence of the sense of a continuous, intelligent and intentional self in humans (and possibly in other life forms, though we cannot be sure of this).

At each point a new and more complex set of properties comes into being, with new laws of interaction between them. The fourth transition is of particular importance, since it introduces a form of subjectivity that has, at least in theory, the ability to transcend the immediate context of its physical origin.

It makes no sense to speak of atoms existing apart from the physical elements (sub-atomic particles) of which they are composed. It does not make much sense to speak of DNA apart from the atoms that constitute it. However even at this stage it is possible to speak of the 'code' that DNA carries for building organic bodies, and that informational code can be abstracted from its 'hardware', its physical carrier. When we describe the genome of a nematode worm, we can do so without having its physical bits in front of us. We can distinguish the information-content of a system from its physical structure. It might be possible to embody the same code in a different physical structure – like moving a computer programme to another computer. Nevertheless, we do not seriously think of the code existing apart from the nucleic acids in which it is embodied, or having some sort of enduring life of its own, except in a metaphorical sense. The distinction between information and physical structure is a purely conceptual one, and we would not normally think of sequences of information as having real existence on their own.

With consciousness, it does make sense to think of some sort of inner conscious life, or of conscious states as having an existence that is in some sense independent of the publicly observable physical states in which it is normally embodied. That is, as David Armstrong says in his book, 'A Materialist Theory of Mind', we can imagine conscious states existing without any associated physical states (though, as a materialist, he obviously thought they did not). But where conscious states are very closely tied to physical stimuli, and where there is little or no sense of continuity, of being 'the same consciousness' throughout a stretch of time, there seems little point in thinking about such conscious states being abstracted from their immediate physical context. Any such consciousness would not be aware that it was the same consciousness that used to exist at some other time or place. There would be little conscious memory or hope and fear for the future. Without a sense of temporality and continuity, a sense of self would not arise.

So it is only with the fourth transition that it fully makes sense to speak about the existence of a free and responsible self, which is what has in the Western tradition been called an intellectual soul. And indeed we hold mature and normally functioning human adults, but not dogs and cats, responsible for their actions. Human persons react to the events they experience in complex ways, and gradually build up a personality and character by their responses and activities. They reflect upon their experiences, and construct imaginative worlds removed from the actual world they inhabit. They form moral communities, in which principles for action are decided upon and reinforced, and within which a sense of moral obligation and of social responsibility develop to various degrees.

Humans have an imaginative, creative and partly self-shaped inner life. While rooted in a particular body and social and physical context, their mental life can to a limited but real extent roam free of attachment to that context. When the ability to act on general principles and to accept moral responsibility for one's actions arises in physical organisms, we can speak of an enduring subjectivity that is self-consciously the same throughout all its experiences.

The sense of being a continuing reflective and responsible self, living in a moral community of similar selves, within which discussion and the formulation of general principles of action takes place, is one that, so far as we can ascertain, exists on this planet only among members of the human species. That is the basis for saying that humans are of unique and distinctive moral value, and that they have a special claim upon our respect. It is also the basis for saying that human selves might be re-embodied in different forms of space and time, and so might, if God so wills, have an immortal existence, a 'resurrection of the body'. Modern science does not have a view of such matters; they are beyond the competence of science. But the scientific view of the universe, contrary to what many people think, can be properly appealed to in support of the belief that humans have a soul, which is the basis of their moral dignity and of the religious hope for immortality.

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