

MICHAEL POLANYI (1891-1976)

PERSONAL KNOWLEDGE, SCIENCE AND THE FREE SOCIETY

Polanyi's Life

Hungarian of Jewish descent, trained as a doctor, physical chemist in Berlin (1920), developed adsorption theory of gases (initially rejected and then accepted), protested against Nazi policy of dismissing Jewish scientists, became Professor of Chemistry at the University of Manchester (1933), visited Soviet Union (1935), developed an interest in economics, opposed bureaucratic control of scientific research, became full-time philosopher of science and culture (1948), Gifford Lectures at Aberdeen (1951-1952), Senior Research Fellow at Merton College, Oxford (1959), lectured frequently in the USA.

Publications

Science, Faith and Society (1946), *The Logic of Liberty* (1951), *Personal Knowledge: Towards a Post-Critical Philosophy* (1958, magnum opus based on his Gifford Lectures), *The Study of Man* (1959), *Beyond Nihilism* (1960, on political ideologies and morality), *The Tacit Dimension* (1966, best entry to his epistemology), *Knowing and Being* (1969, essays edited by Marjorie Grene on totalitarian and free societies, the nature of science, tacit knowledge, biology and consciousness), *Scientific Thought and Social Reality* (1974, essays edited by Fred Schwartz), *Meaning* (1975, essays edited by Harry Prosch on personal knowledge, ontology, metaphor, art, myths and religion).

Polanyi's Approach

1. Concern over moral decline in Western democracies and revulsion against the oppressions and inhumanities of Naziism and Communism. Tyrannies are inhumane in seeking to establish delusory utopias, motivated by subconscious moral ideals, while maintaining that morality is merely subjective, whereas science is validly objective ('moral inversion'). Hence the end (the utopia) justifies the means (elimination of all opponents).
2. Promotion of scientism (only science can give us true objective knowledge) led to a rejection of any objectivity in moral and spiritual values.
3. The history of science shows that science cannot provide certain and purely objective knowledge. Both fundamental beliefs and personal evaluations are intrinsic to the successful practice of science and creativity of thought is needed for the identification of problems and their solution.
4. In *Personal Knowledge* Polanyi develops a new epistemology that allows for the paradox that we can validly justify our knowledge, although it is fallible and revisable; an emphasis that all knowing involves personal components; arguments against scientism and objectivism (i.e., valid knowledge is wholly objective and mind-independent); an ontological hierarchy; a philosophy of biology; arguments against reductionism and the adequacy of neo-Darwinism.
5. Only by showing that all knowledge is personal and that science involves personal and moral values can democracy be preserved. Scientism and objectivism subjectivises morality and opens the door for politicians and extremists to pervert the democratic system and undermine it.
6. Polanyi's philosophy is 'post-critical' in that it seeks to bypass the epistemological agenda stemming from Rene Descartes of seeking to explain how an ahistorical, non-social discarnate rational subject can gain knowledge within a physical world. For Polanyi human beings are essentially embodied within the physical world and live within social traditions that are essential to their being. Polanyi's epistemology is also 'post-critical' in the sense that it accepts the Enlightenment's demand for the justification of valid knowledge but is not limited by the criteria for justification in the rationalist, empiricist and Kantian traditions.

The Universal Presence of Tacit Knowledge in All Perception and Knowledge

Psychologists have shown the reality of subception, an awareness not consciously appropriated in our knowledge of the external world, e.g., awareness of the periphery of the field of vision imparts the sense of stability and movement. Gestalt psychologists have shown that we know comprehensive wholes such that the subsidiary parts gain their significance by being integrated into our perception of the whole, e.g., patches of fur and shapes are recognised as being a dog. In apprehending three-dimensional objects our minds contribute to our awareness and supply aspects that are not actually observable, e.g., expectation of parallel railway lines although they are seen to converge. We can observe a rapidly changing object, e.g., a hand, and yet still identify it as a single object. We can identify something, e.g., recognising a woman's face, and yet be unable to say what it is we identify. When we use tools and probes they become extensions of ourselves for we concentrate on their operation, e.g., knocking a nail into a piece of wood, and not on the feelings in our hands and fingers. Physical skills are learned without being able to say fully how we do them, e.g., learning to ride a bike. Likewise professional skills are acquired without being able to state all the rules that are involved, e.g., gaining the skill of a surgeon or mathematician. Polanyi's famous maxim: 'We know more than we can tell.'

The Relationship between Subsidiary Tacit Knowledge and Explicit Focal Knowledge

It was Polanyi's original contribution to epistemology to make clear that in knowing something we attend *from* our subsidiary tacit awareness of the constituents of an entity or object of knowledge *to* a comprehension of the entity or object of knowledge. We assimilate the subsidiary aspects of the object of knowledge, often subconsciously, and integrate them to form our knowledge of the object. This runs counter to the empiricist view of David Hume and others that we are primarily aware of our sensations and then construct our knowledge of the external world from them. In perception we are primarily aware of objects and not the sensations, which are the *means* by which we know them. Polanyi identified four aspects of the relationship between our subsidiary tacit knowledge and our objective focal knowledge.

The Functional Relation

Through awareness of subsidiary aspects one integrates these aspects and attends to the resulting focal object of knowledge. There is a 'from-to' relationship between the subsidiary and the focal. We do not know all the subsidiary aspects, e.g., in recognising a face, in the generation of a three-dimensional object in a stereoscope from two two-dimensional photographs.

The Phenomenal Relation

Our apprehension of the subsidiaries is transformed by being integrated into the focal object of knowledge. Sensations of shape and colour are transformed when seen as parts of an object, such as an animal.

The Semantic Relation

The significance of the subsidiary aspects is found in the way they act as signs for the focal and thus gain their meaning from the focal object of knowledge. If we have parts of a photograph of a face we can only recognise the face and identify the person when the parts are put together. Meaning is always attained when a 'from-to' function exists in our awareness and so perception is always an act of judgment that bears a meaning for us. Likewise gaining knowledge is an achievement.

The Ontological Relation

From the functional, phenomenal and semantic relationships between the subsidiary and focal awareness it is possible to derive an ontological relation between the subsidiaries and the focal object of knowledge. The subsidiary elements in our awareness are derived from the constituents of the object. Both the subsidiary and focal components are necessary to each other in an act of knowing. So they constitute an entity that comprehends both of them. Polanyi called such an object of knowledge a 'comprehensive entity'. A meaningful relationship between the subsidiary and the focal terms grants us an understanding of a comprehensive entity, which these two terms jointly constitute.

The subsidiaries represent particular aspects of the comprehensive entity, which we recognise by relying on our awareness of these subsidiaries in order to attend to their joint meaning, which is the comprehensive entity we know. This ontological relation is the basis on which Polanyi builds his ontological hierarchy.

Knowledge and Skills through the Indwelling of Subsidiaries

The operation of our sensual organs and nervous system is psychosomatic. Thus, just as we indwell our bodies in living, so we indwell our subsidiary awareness, i.e., sensations, in order to perceive external objects. Likewise we indwell our acquired capabilities in the exercise of a physical skill, e.g., using a tool, driving a vehicle. Scientists and other academics indwell their theories in evaluating observed evidence. Thus scientific evidence is 'theory-laden', not wholly objective. Also most scientific theories are 'evidence-oriented' and are not merely calculating devices as scientific positivism supposed (instrumentalism). Scientists generally expect their theories to be analogical models of external physical reality and a reliable way of predicting relevant future observations.

If we concentrate our attention on the subsidiaries their joint meaning is lost. Concentrating on a feature of a face means that we lose the recognition of whose face it is. Concentrating on the brush strokes of a painting means that we are no longer aware of what the painting depicts. Concentrating on the repetitive sound of a word results in its meaning fading from our attention.

The Fiduciary Framework

Through our upbringing from childhood we subconsciously acquire fundamental (basic) beliefs by which and out of which we live, e.g., the care of our parents, the need of food and that eating gives us pleasure, etc. Throughout our lives this framework of beliefs is being extended and altered. Thus we gain our common sense notions of the permanence of solid objects and the acceptance of physical causation. At the same time we imbibe various social and cultural beliefs, political ideologies, scientific theories, religious or irreligious beliefs, etc. We absorb some beliefs quite spontaneously without being consciously aware of that. These notions and beliefs form a fiduciary framework (*fiducia*, Latin for trust/faith) by which we live and by which we interpret and evaluate what we know. We can only have knowledge from the perspective of a fiduciary (categorical) framework and so all our knowledge is personal and evaluative, as well as informational. Our knowledge is not and cannot be wholly objective and impersonal. Some of our fiduciary framework, which includes basic beliefs, categories and concepts, is not explicit to us but it has a governing role in our knowing. Polanyi strongly emphasised how skills in science and technology and appreciation in literature, art and music are imparted within traditions, whereby important aspects of the skills and appreciation is gained tacitly without conscious appropriation.

The Definition of Reality

How can we tell the difference between reality and illusion? How can a scientist tell the difference between an unobservable real entity, e.g., an electron, and a spurious hypothetical entity, e.g., the ether? For Polanyi what is real will manifest itself in the future in what are at present unpredictable ways. Valid scientific theories are realities because they have unforeseen consequences, e.g., Copernicus's heliocentric theory of the solar system led to Kepler's three laws of planetary motion and Newton's law of gravitation.

Man's creations in literature, art, music, politics, law and economics are also realities because they can manifest themselves in the future in ways that are at present unpredictable. The validity of artistic creations is shown by the significance they convey in giving new and indeterminate apprehensions of reality.

All that we know has some kind of meaning or significance. The degree of significance depends upon the possible range of future manifestations that it could convey. Thus a scientific theory may be more real than a stone.

Ontological Hierarchies

A comprehensive entity has components that are the source of the subsidiaries by which we know it. Hence there is an analogous relationship between the form of knowing from the tacit to the focal knowledge (the subsidiary-focal relationship) and the structure of a comprehensive entity (the parts-whole relationship). An ontological hierarchy exists when a comprehensive entity is constituted in its being by the integration of its parts, such that the principles of operation of the whole are not deducible from the characteristics of its parts. For example, a machine, such as an internal combustion engine, converts the power of a rapid series of explosions of petrol-air mixture in the cylinders into the rotational power of the engine. As such, the engine has this operational principle by which it works and this principle expresses the purpose of the engine, namely, that of propelling a vehicle. This purpose is intrinsic to what the engine is and is not explicable in terms of the physico-chemical characteristics of its component parts. A machine is thus an ontological hierarchy: (1) the metal parts that are explicable in terms of physical and chemical laws; (2) the machine whose workings, i.e., speed, heat input, power, efficiency, etc., are not expressible in terms of the physico-chemical laws that apply to its parts. The operational principle of the machine is scientifically explicable but can only be known in terms of the overall *purpose* of the machine. We can only comprehend a machine as a machine by recognising its *purpose* and so teleology is intrinsic to the creations of man. In the case of a machine movement and time are intrinsic to its being as an operating machine.

Ontological Hierarchies in Biological Organisms

As Kant noted in his *Critique of Judgment* we can only have knowledge of biological organs and organisms in terms of the purposes they embody. Whereas Kant held that we must remain agnostic as to whether these purposes actually exist in nature, Polanyi's realist epistemology holds that we can identify organs and organisms as organs and organisms *only by tacitly acknowledging that they have purposes as we indwell what we observe*. Moreover we can only understand the behaviour of sentient animals by indwelling their movements, e.g., noting how a lion stalks its prey or the mating rituals of birds, and thereby tacitly ascribing purpose to their activities.

Thus Polanyi identifies this ontological hierarchy in man: (1) the physico-chemical level of atoms and chemicals; (2) the biological machine level as in the functioning of cells and organs such as the heart and stomach; (3) purposive regulation of the whole body, e.g., in the

regulation of temperature, the growth of the embryo; (4) muscular movement and mobility; (5) sentience with its instinctual and innate patterns of behaviour, e.g., satisfaction of hunger, reflexes; (6) the sense of individuality; (7) sociability as with the level of intelligent animals; (8) intelligence and language; (9) creative activity in relationships, love, science, literature, art, politics, etc., (10) awareness of a spiritual and moral domain that transcends man. Each level in the hierarchy is needed for and open to the level above it but cannot determine the nature of the level above it. The higher level has principles that are not explicable in terms of the lower level. The higher level manifests a significance and purpose that cannot be expressed in terms of the characteristics of the lower level.

Rejection of Reductionism

Polanyi countered reductionism by reference to the way we know machines at two distinct levels, i.e., (1) the parts of the machine; (2) the combination of the parts to form the machine so that its operation can be achieved and its purpose expressed. To appreciate the workings and purpose of the machine we indwell their parts in terms of the operation of the whole. Likewise we tacitly know a hierarchy in man, and can only know what a human being is in these terms, whether we explicitly acknowledge a hierarchy in him or not. Thus teleology is intrinsic the realm of living creatures and the creations of man. Moreover we continuously make personal and moral evaluations in human relationships.

Rejection of Scepticism

Epistemological scepticism stemming from David Hume held that we know our sensations but *cannot justify* our claims to know external objects and their causal interaction. Just as Thomas Reid pointed out in his refutation of Hume's scepticism, Polanyi emphasises that our sensations are the *means* by which we know external objects. By tacit knowing and the indwelling of what we know, our knowledge can penetrate into the structures of external reality. We are able to recognise, implicitly at least, an ontological hierarchy in living creatures because we each embody a living ontological hierarchy. Thus we validly ascribe teleology to other creatures as well as to ourselves, which runs counter to much modern denial of teleology in nature by many biologists.

Moreover, a claim in science to knowledge implies that all other rational people should be able to accept it for themselves. Such claims are made with 'universal intent'. We recognise that we have a responsibility to affirm what is true and report the results of experiments correctly. A scientist who forges his experimental results to justify his theory is universally condemned. So this shows that science is essentially a moral endeavour and we live in a moral universe. So the *truth* of what we know transcends us and this implies that what we know is not conditioned by and limited by what we are.

Further Reading

Richard Allen, *Polanyi: Thinkers of Our Time*. Claridge Press, 1990. Short introduction.
 Drusilla Scott, *Everyman Revived: The Common Sense of Michael Polanyi*. Book Guild, 1985; Eerdmans, 1995); republished as *Michael Polanyi* (SPCK, 1996). Very readable.
 Harry Prosch, *Michael Polanyi: A Critical Exposition*. State University of New York Press, 1986. Comprehensive survey of Polanyi's thought and subsequent responses to it.
 Jerry H. Gill, *The Tacit Mode: Michael Polanyi's Postmodern Philosophy*. State University of New York Press, 2000. Exploration of the significance of Polanyi's epistemology for science, philosophy, art, language, political theory and religion by a professional philosopher.
 Thomas F. Torrance, ed., *Belief in Science and in Christian Life: The Relevance of Michael Polanyi's Thought for Christian Faith and Life*. Handsel Press, 1980.
And on the web: at: www.spcps.org.uk - an article on Polanyi written by Richard Allen, the Chairman of the Society of Post-Critical and Personalist Studies.