Philosophy of sciences

Michael Polanyi and tacit knowledge
http://infed.org/mobi/michael-polanyi-and-tacit-knowledge/

Michael Polanyi helped to deepen our appreciation of the contribution of 'tacit knowing' to the generation of new understandings and social and scientific discovery.

Michael Polanyi (1891-1976) made a profound contribution both to the philosophy of science and social science. Born in Budapest into a upper class Jewish family, he studied at the University there (gaining doctoral degrees both in medicine and physical science) and at Karlsruhe. His initial work was as a physical chemist – undertaking significant work at the University of Berlin (and other universities) on crystal structure and reaction kinetics. With the rise to power in Germany of Hitler, Michael Polanyi emigrated to Britain and became Professor of Physical Chemistry at the University of Manchester (1933-1948). In a significant shift, following his growing contribution to the literature of social science and philosophy, Michael Polanyi then became Professor of Social Sciences at Manchester (1948-58). He also lectured as visiting professor or senior fellow at the universities of Chicago, Aberdeen, Virginia, Stanford and Merton College, Oxford.

Tacit knowledge

Central to Michael Polanyi's thinking was the belief that creative acts (especially acts of discovery) are shot-through or charged with strong personal feelings and commitments (hence the title of his most famous work *Personal Knowledge*). Arguing against the then dominant position that science was somehow value-free, Michael Polanyi sought to bring into creative tension a concern with reasoned and critical interrogation with other, more 'tacit', forms of knowing.

Polanyi's argument was that the informed guesses, hunches and imaginings that are part of exploratory acts are motivated by what he describes as 'passions'.

They might well be aimed at discovering 'truth', but they are not necessarily in a form that can be stated in propositional or formal terms.

As Michael Polanyi (1967: 4) wrote in *The Tacit Dimension,* we should start from the fact that *'we can know more than we can tell*'. He termed this pre-logical phase of knowing as 'tacit knowledge'.

Tacit knowledge comprises a range of conceptual and sensory information and images that can be brought to bear in an attempt to make sense of something (see Hodgkin 1991). Many bits of tacit knowledge can be brought together to help form a new model or theory. This inevitably led him to explore connoisseurship and the process of discovery (rather than with the validation or refutation of theories and models – in contrast with Popper, for example).

To hold such knowledge is an act deeply committed to the conviction that there is something there to be discovered. It is personal, in the sense of involving the personality of him who holds it, and also in the sense of being, as a rule, solitary; but there is no trace in it of self-indulgence.

The discoverer is filled with a compelling sense of responsibility for the pursuit of a hidden truth, which demands his services for revealing it.

His act of knowing exercises a personal judgement in relating evidence to an external reality, an aspect of which he is seeking to apprehend. (Polanyi 1967: 24-5)

Michael Polanyi placed a strong emphasis on dialogue within an open community. He recognized the strength by which we hold opinions and understandings and our resistance to changing them.

Unlike many of his contemporaries he placed his thinking within an appreciation of God and of the power of worship – especially in his later writing (see, for example, *Meaning*). In his earlier work (especially in *Personal Knowledge*) Polanyi seems to be preoccupied with 'setting forth ways to think about religious meaning as an articulate system or framework related to other articulate systems' (Mullins undated). Later Michael Polanyi attempted to extend his model to describe the nature of human knowledge found in art, myth and religion.

In 1951 and 1952 Polanyi gave the Gifford Lectures that became his magnum opus, *Personal Knowledge: Towards a Post-Critical Philosophy* (1958).

In a comprehensive treatment of human knowing he proposed overturning the last three centuries' habit of thinking that our most genuine knowledge is found by a method that separates the observer from the subject of study and proceeds by neutrally collecting data and drawing conclusions from it.

Instead, Polanyi showed from the practice of science that discovery of scientific reality is guided by a passionate dedication nurtured by a conscientious community of inquirers. He upheld objective knowledge as "personal knowledge" because it involved human participation in strategic and significant ways.

Polanyi's view meant that the most exact facts could not be separated from the values of the knower and the traditions that guided them.

The foundations of a free society that saw the truth of reality as independent of people yet found by individuals seeking the truth, stating their findings, and establishing agreement by open discussion are fundamental to the pursuit of science and knowledge generally. Many modern ideologies had produced totalitarianism and nihilism by a belief in naked truth separated from moral convictions that called for respect for persons and ideals.

Conclusion

In respect of the philosophy of science, it can be argued that Michael Polanyi helped to pave the way for Thomas Kuhn's groundbreaking work on the structure of scientific revolutions.

Perhaps the strongest echo of his work that we encounter as educators comes through the work of Donald Schön and Chris Argyris on knowing in action, and in Eisner's consistent arguments for connoisseurship and criticism in evaluation. It also has parallels in Jerome Bruner's (1960) distinction between mediated and immediate cognition or apprehension.

By paying attention to Polanyi's conception of the tacit dimension we can begin to make sense of the place of intuition and hunches in informal education practice – and how we can come a better understanding of what might be going on in different situations. Significantly, his attention to passions and commitments throws fresh light on the praxis (informed, committed actions) that stand at the heart of informal education.

Further reading and bibliography

Mullins, P. (undated) 'Michael Polanyi 1891-1976', *deepsite.org*, http://www.deepsight.org/articles/polanyi.htm. Visited October 2, 2003. Useful introductory overview of Polanyi's contribution with special reference to religious thought.

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Links

Try the Polanyi Society homepage (http://www.missouriwestern.edu/orgs/polanyi/) (includes essays by Polanyi, a guide to archive material and details of The Polanyi Society Periodical).

The picture of Michael Polanyi was sourced from The Polanyi Society: https://www.missouriwestern.edu/orgs/polanyi/gallery.htm

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Michael Polanyi
From Wikipedia, the free encyclopedia

http://en.wikipedia.org/wiki/Michael_Polanyi

Michael Polanyi, FRS[1] (11 March 1891 – 22 February 1976) was a Hungarian-British polymath, who made important theoretical contributions to physical chemistry, economics, and philosophy. He argued that positivism supplies a false account of knowing, which if taken seriously undermines our highest achievements as human beings.

His wide-ranging research in physical science included chemical kinetics, x-ray diffraction, and adsorption of gases. He pioneered the theory of fibre diffraction analysis in 1921, and the dislocation theory of plastic deformation of ductile metals and other materials in 1934.

He emigrated to Germany, in 1926 becoming a chemistry professor at the Kaiser Wilhelm Institute in Berlin, and then in 1933 to England, becoming first a chemistry professor, and then a social sciences professor at the University of Manchester. Two of his chemistry pupils and his son won Nobel Prizes. He was elected to the Royal Society and the American Academy of Arts and Sciences. His contributions to the social sciences, for example his application of the concept of a polycentric spontaneous order, were developed in the context of his opposition to central planning.

Early life[edit]

Polanyi, born Polányi Mihály (pronounced [ˈpolaːɲi ˈmihaːj]) in Budapest, was the fifth child of Mihály and Cecília Pollacsek, secular Jews from Ungvár (then in Hungary but now in Ukraine) and Vilnius in Lithuania, respectively. His father's family were entrepreneurs, while his mother's father was the chief rabbi of Vilnius. The family moved to Budapest and Magyarized their surname to Polányi. His father built much of the Hungarian railway system, but lost most of his fortune in 1899 when bad weather caused a railway building project to go over budget. He died in 1905. Cecília Polanyi established a salon that was well known among Budapest's intellectuals, and which continued until her death in 1939. His older brother was Karl Polanyi, the political economist and anthropologist, and his niece was Eva Zeisel, a world-renowned ceramist.[2]

Education[edit]

In 1909, after leaving the famous Budapest teacher-training secondary school (Mintagymnasium), he trained as a physician, obtaining a medical diploma in 1914. He was an active member of the Galilei Society. With the support of Ignác Pfeifer, professor of chemistry at the József Technical University of Budapest, he obtained a scholarship to study chemistry at the Technische Hochschule in Karlsruhe, Germany. In the First World War, he served in the Austro-Hungarian army as a medical officer, and was sent to the Serbian front. While on sick-leave in 1916, he wrote a PhD thesis on adsorption. His research, which was encouraged by Albert Einstein, was supervised by Gusztáv Buchböck, and in 1919 the University of Budapest awarded him a doctorate.

Career[edit]

In October 1918, Mihály Károlyi established the Hungarian Democratic Republic, and Polanyi became Secretary to the Minister of Health. When Communists seized power in March 1919 he refused to serve in the Red Army and returned to medicine. When the Hungarian Soviet Republic was overthrown, Polanyi emigrated to Karlsruhe, and was invited by Fritz Haber to join the Kaiser Wilhelm Institut für Faserstoffchemie in Berlin. In 1923 Polanyi converted to Christianity, and in a Roman Catholic ceremony married Magda Elizabeth Kemeny. In 1926 he became the professorial head of department of the Institut für Physikalische Chemie und Elektrochemie. In 1929, Magda gave birth to their son John, who when he reached adulthood settled in Canada, and was awarded a Nobel Prize in chemistry in 1986. Their other son, George Polanyi, became a well-known British economist.

His experience of runaway inflation and high unemployment in Weimar Germany led Polanyi to become interested in economics. With the coming to power in 1933 of the Nazi party, he accepted a chair in physical chemistry at the University of Manchester. Two of his pupils, Eugene Wigner and Melvin Calvin went on to win a Nobel Prize. Because of his increasing interest in the social sciences, Manchester University created a new chair in Social Science (1948–58) for him.

In 1944 Polanyi was elected a member of the Royal Society,[1] and on his retirement from the University of Manchester in 1958 he was elected a Senior Research Fellow at Merton College, Oxford. In 1962 he was elected a Foreign Honorary Member of the American Academy of Arts and Sciences.[3]

Work[edit]

Physical chemistry[edit]

Polanyi's scientific interests were extremely diverse, including work in chemical kinetics, x-ray diffraction, and the adsorption of gases at solid surfaces. He is also

well known for his potential adsorption theory which was disputed for quite some time. In 1921, he laid the mathematical foundation of fibre diffraction analysis. In 1934, Polanyi, at about the same time as G. I. Taylor and Egon Orowan, realised that the plastic deformation of ductile materials could be explained in terms of the theory of dislocations which had been developed by Vito Volterra in 1905. The insight was critical in developing the field of solid mechanics.

Freedom and community[edit]

In 1936, as a consequence of an invitation to give lectures for the Ministry of Heavy Industry in the USSR, Polanyi met Bukharin, who told him that in socialist societies all scientific research is directed to accord with the needs of the latest Five Year Plan. Polanyi noted what had happened to the study of genetics in the Soviet Union once the doctrines of Trofim Lysenko had gained the backing of the State. Demands in Britain, for example by the Marxist John Desmond Bernal, for centrally planned scientific research led Polanyi to defend the claim that science requires free debate. Together with John Baker, he founded the influential Society for Freedom in Science.

In a series of articles, re-published in *The Contempt of Freedom* (1940) and *The Logic of Liberty* (1951), Polanyi claimed that co-operation amongst scientists is analogous to the way in which agents co-ordinate themselves within a free market. Just as consumers in a free market determine the value of products, science is a spontaneous order that arises as a consequence of open debate amongst specialists. Science (contrary to the claims of Bukharin) flourishes when scientists have the liberty to pursue truth as an end in itself:

"[S]cientists, freely making their own choice of problems and pursuing them in the light of their own personal judgment, are in fact co-operating as members of a closely knit organization."

"Such self-co-ordination of independent initiatives leads to a joint result which is unpremeditated by any of those who bring it about."

"Any attempt to organize the group ... under a single authority would eliminate their independent initiatives, and thus reduce their joint effectiveness to that of the single person directing them from the centre. It would, in effect, paralyse their co-operation."

He derived the phrase spontaneous order from Gestalt psychology, and it was adopted by the classical liberal economist Frederick Hayek, although the concept

can be traced back to at least Adam Smith. Polanyi (unlike Hayek) argued that there are higher and lower forms of spontaneous order, and he asserted that defending scientific inquiry on utilitarian or sceptical grounds undermined the practice of science. He extends this into a general claim about free societies. Polanyi defends a free society not on the negative grounds that we ought to respect "private liberties", but on the positive grounds that "public liberties" facilitate our pursuit of objective ideals.

According to Polanyi a free society which strives to be value neutral undermines its own justification. But it is not enough for the members of a free society to believe that ideals such as truth, justice, and beauty, are objective, they also have to accept that they transcend our ability to wholly capture them. The objectivity of values has to be combined with acceptance that all knowing is fallible.

In *Full Employment and Free Trade* (1948) Polanyi analyses the way in which money circulates around an economy, and in a monetarist analysis which according to Paul Craig Roberts was thirty years ahead of its time, he argues that a free market economy should not be left to be wholly self-adjusting. A central bank should attempt to moderate economic booms/busts via a strict/loose monetary policy.

All knowing is personal[edit]

In his book *Science, Faith and Society* (1946), Polanyi set out his opposition to a positivist account of science, noting that it ignores the role which personal commitments play in the practice of science. Polanyi was invited to give the prestigious Gifford Lectures in 1951-2 at Aberdeen. A revised version of his lectures were later published as *Personal Knowledge* (1958). In this book Polanyi claims that all knowledge claims (including those which are derived from rules) rely on personal judgements.[4] He denies that a scientific method can yield truth mechanically. All knowing, no matter how formalised, relies upon commitments. Polanyi argued that the assumptions which underlie critical philosophy are not only false, they undermine the commitments which motivate our highest achievements. He advocates a fiduciary post-critical approach, in which we recognise that we believe more than we can prove, and know more than we can say.

A knower does not stand apart from the universe, but participates personally within it. Our intellectual skills are driven by passionate commitments that motivate discovery and validation. According to Polanyi, a great scientist not only identifies patterns, but also chooses significant questions likely to lead to a successful resolution. Innovators risk their reputation by committing to a hypothesis. Polanyi cites the example of Copernicus, who declared that the Earth revolves around the Sun. He claims that Copernicus arrived at the Earth's true relation to the Sun not as

a consequence of following a method, but via "the greater intellectual satisfaction he derived from the celestial panorama as seen from the Sun instead of the Earth."[5] His writings on the practice of science influenced Thomas Kuhn and Paul Feyerabend.

Polanyi rejected the claim by British Empiricists that experience can be reduced into sense data, but he also rejects the notion that "indwelling" within (sometimes incompatible) interpretative frameworks traps us within them. Our tacit awareness connects us, albeit fallibly, with reality. It supplies us with the context within which our articulations have meaning. Contrary to the views of his colleague and friend Alan Turing, whose work at The University of Manchester prepared the way for the first modern computer, he denied that minds are reducible to collections of rules. His work influenced the critique by Hubert Dreyfus of "First Generation" Artificial Intelligence.

It was while writing *Personal Knowledge* that he identified the "structure of tacit knowing". He viewed it as his most important discovery. He claimed that we experience the world by integrating our subsidiary awareness into a focal awareness. In his later work, for example his Terry Lectures, later published as *The Tacit Dimension* (1966) he distinguishes between the phenomenological, instrumental, semantic, and ontological aspects of tacit knowing, as discussed (but not necessarily identified as such) in his previous writing.

Critique of reductionism[edit]

In "Life's irreducible structure" (1968),[6] Polanyi argues that the information contained in the DNA molecule is not reducible to the laws of physics and chemistry. Although a DNA molecule cannot exist without physical properties, these properties are constrained by higher-level ordering principles. In "Transcendence and Self-transcendence" (1970),[7] Polanyi criticises the mechanistic world view that modern science inherited from Galileo.

Polanyi advocates emergence i.e. the claim that there are several levels of reality and of causality. He relies on the assumption that boundary conditions supply degrees of freedom that, instead of being random, are determined by higher-level realities, whose properties are dependent on but distinct from the lower level from which they emerge. An example of a higher-level reality functioning as a downward causal force is consciousness – intentionality – generating meanings – intensionality.

Mind is a higher-level expression of the capacity of living organisms for discrimination. Our pursuit of self-set ideals such as truth and justice enriches our awareness of the world. The reductionistic attempt to reduce higher-level realities

into lower-level realities generates what Polanyi calls a moral inversion, in which the higher is rejected with moral passion. Polanyi identifies it as a pathology of the modern mind and traces its origins to a false conception of knowledge; although it is relatively harmless in the formal sciences, that pathology generates nihilism in the humanities. Polanyi considered Marxism to be an example of moral inversion. In Marxism, the State, ostensibly acting in accordance with the logic of history, is obliged to use its coercive powers in ways that disregard any appeals to morality.[8]

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Michael Polanyi Quotes

http://www.brainyquote.com/quotes/authors/m/michael_polanyi.html

These maxims and the art of interpreting them may be said to constitute the premisses of science but I prefer to call them our scientific beliefs. These premisses or beliefs are embodied in a tradition, the tradition of science.

Moreover, only a strong and united scientific opinion imposing the intrinsic value of scientific progress on society at large can elicit the support of scientific inquiry by the general public.

Admittedly, scientific authority is not distributed evenly throughout the body of scientists; some distinguished members of the profession predominate over others of a more junior standing.

Admittedly, the body of scientists, as a whole, does uphold the authority of science over the lay public. It controls thereby also the process by which young men are trained to become members of the scientific profession.

I shall suggest, on the contrary, that all communication relies, to a noticeable extent on evoking knowledge that we cannot tell, and that all our knowledge of mental processes, like feelings or conscious intellectual activities, is based on a knowledge which we cannot tell.

The process of philosophic and scientific enlightenment has shaken the stability of beliefs held explicitly as articles of faith.

The first thing to make clear is that scientists, freely making their own choice of problems and pursuing them in the light of their own personal judgment, are in fact co-operating as members of a closely knit organization.

Michael Polanyi

From Wikiquote

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http://en.wikiquote.org/wiki/Michael_Polanyi

Michael Polanyi (March 11, 1891 – February 22, 1976), born Polányi Mihály, was a Hungarian–British polymath whose thought and work extended across physical chemistry, economics, and philosophy. He was a Fellow of the Royal Society and a Fellow of Merton College, Oxford.

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Sourced[edit]

The Logic of Liberty (1951)[edit]

- When order is achieved among human beings by allowing them to interact with each other on their own initiative — subject only to the laws which uniformly apply to all of them — we have a system of spontaneous order in society.

Personal Knowledge (1958)[edit]

- Comprehension is neither an arbitrary act nor a passive experience, but a responsible act claiming universal validity. Such knowing is indeed objective in the sense of establishing contact with a hidden reality; a contact that is defined as the condition for anticipating an indeterminate range of yet unknown (and perhaps yet inconceivable) true implications. It seems reasonable to describe this fusion of the personal and the objective as Personal Knowledge. Personal knowledge is an intellectual commitment, and

as such inherently hazardous. Only affirmations that could be false can be said to convey objective knowledge of this kind. (vii-viii)

- **Ever since [Copernicus], writers eager to drive the lesson home have urged us [...] to abandon all sentimental egoism, and to see ourselves objectively in the true perspective of time and space. What precisely does this mean? In a full 'main feature' film, recapitulating faithfully the complete history of the universe, the rise of human beings from the first beginnings of man to the achievements of the twentieth century would flash by in a single second. Alternatively, if we decided to examine the universe objectively in the sense of paying equal attention to portions of equal mass, this would result in a lifelong preoccupation with interstellar dust, relieved only at brief intervals by a survey of incandescent masses of hydrogen — not in a thousand million lifetimes would the turn come to give man even a second's notice. It goes without saying that no one — scientists included — looks at the universe in this way, whatever lip-service is given to 'objectivity.' (3)**

- **While the *articulate contents of science* are successfully taught all over the world in hundreds of universities, *the unspecifiable art of scientific research* has not yet penetrated to many of these.**

- **To learn by example is to submit to authority. ...By watching the master and emulating his efforts in the presence of his example, the apprentice unconsciously picks up the rules of the art, including those which are not explicitly known to the master himself. These hidden rules can be assimilated only by a person who surrenders himself to that extent uncritically to the imitation of another. A society which wants to preserve a fund of personal knowledge must submit to tradition. ...Common Law ...is the most important system of strictly traditional activities.**

Life's irreducible structure **(1968)[edit]**

- **The recognition of certain basic impossibilities has laid the foundations of some major principles of physics and chemistry; similarly, recognition of the impossibility of understanding living things in terms of physics and chemistry, far from setting limits to our understanding of life, will guide it in the right direction. And even if the demonstration of this impossibility should prove of no great advantage in the pursuit of discovery, such a demonstration would help to draw a truer image of life and man than that given us by the present basic concepts of biology.**

Transcendence And Self-Transcendence **(1970)[edit]**

- **Our view of life must account for how we know life; biological theories must allow for their own discovery and employment. Theories of evolution must provide for the creative acts which brought such theories into existence. Beginning with our own embodiment our theory of knowledge must endorse the ways we manifestly transcend our embodiment by acts of indwelling and extension into more subtle and intangible realms of being, where we meet our ultimate ends.**

Quotes about Polanyi[edit]

- **Polanyi's model, quite clearly, was one of empowerment, in two different yet related ways. First, the master possesses all of the power in respect to his of her apprentice. Polanyi strongly implies that knowledge (and hence power) flows in one direction only: from teacher to pupil. Second, once the apprentice has obtained the necessary tacit knowledge, he or she is empowered with respect to those in the community who do not possess such knowledge. Polanyi's scheme was one of extreme elitism.**
  - **Myles W. Jackson, *Spectrum of Belief: Joseph Von Fraunhofer and the Craft of Precision Optics* (2000)**

Michael Polanyi
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Michael Polanyi

Michael Polanyi (1891-1976), a medical doctor, physical chemist, social thinker, and philosopher, made his most important contribution in the area of humanizing scientific inquiry. He proposed a new theory of knowledge based on an appreciation of the role of the individual and the individual's and society's values in the seeking and finding of truth.

Michael Polanyi was born on March 11, 1891, in Budapest, Hungary, the fifth child of Michael Pollacsek and Cecilia Wohl. His family life was marked by a rich and stimulating intellectual world that combined theoretical and practical concerns and artistic, literary, and social issues. His father was a civil engineer, and his mother was the center of a circle of poets, painters, and scholars. His two brothers and two sisters were all in their own ways distinguished. In his lifetime Michael Polanyi had four careers—medical doctor, physical chemist, social thinker, and philosopher. Leaving medicine early for the attraction of scientific research, he achieved international recognition in his other fields. His talent and breadth of knowledge made him a polymath and prepared him for the philosophical creativity that crowned his life with a vision and proposal for a new theory of knowledge—a theory intended to save advanced scientific culture from its own self-destruction by its dehumanized notion of objective detachment.

From the time of his entrance to the University of Budapest in 1908 until his death on February 22, 1976, Polanyi's life was devoted to the pursuit of scientific knowledge and to its meaning for the life of humanity. In the first part of his professional life, the advancement of scientific knowledge was his livelihood and the understanding of the implications of science for society was his avocation. In the later part of his life, the understanding of science's intellectual impact on society became his profession for the purpose of maintaining the basis of creative scientific research and for the liberation of humanity from the tyrannies based on scientism.

At the University of Budapest he was a founder in 1908 of the Galilei Circle, a progressive-minded student society devoted to discussions of science, politics, and religion. Barely 19 years old, he published his first scientific paper in 1910 and graduated as a Doctor of Medicine in 1913. His scientific interests led him to further

study in chemistry at the Technische Hochschule, Karlsruhe, Germany. During this time he published several papers on the second law of thermodynamics, but the outbreak of World War I involved him as a medical officer and his scientific research was curbed until he contracted diptheria. During his convalescence he wrote a Ph.D. thesis on the adsorption of gases by solids, which not only earned him his doctorate in 1917 but also the attention of Einstein and of Fritz Haber, head of the Kaiser Wilhelm Institute of Physical Chemistry in Berlin. In 1920 he was appointed a member of the Kaiser Wilhelm Institute for Fiber Chemistry, where he developed new methods of X-ray analysis pertinent to fibrous structures, metals, and crystals. His success led to his appointment in 1923 to the Kaiser Wilhelm Institute for Physical Chemistry, where he made contributions not only in crystallography but also in reaction kinetics.

Never a one sided person, Polanyi maintained his interest in social and intellectual issues and in 1928 formed a study group on Soviet affairs with Leo Szilard, Eugene Wigner, and John Von Neumann (all became distinguished scientists). In 1933, in protest against Hitler's dismissal of Jewish professors, he resigned his position at the Kaiser Wilhelm Institute. Within a few months he was invited to take the chair of physical chemistry at the University of Manchester in England, and he moved there with his wife and two sons that autumn. He had married Magda Kemeny in 1921, herself an able chemist and author of a dictionary on textile chemistry. Their two sons, George and John, became respectively an economist and a physical chemist.

During the years in Manchester he continued to be productive in research in chemical reaction rates and in transition state theory, but Polanyi's inherent concern for the relations of science and society led him into basic questions about scientific reality and the importance of human freedom. He believed from his experience in science that there was a necessary connection between the premises of a free society and the discovery of scientific truths. Around him, in the Soviet Union and in Nazi Germany, and even among some leaders in Great Britain, Polanyi saw science changing toward control by the state and losing its creative independence and search for truth.

In 1938 he joined with J. R. Baker and others in forming the Society for the Freedom of Science. Between 1935 and 1946 he visited the Soviet Union and published critiques of planned economy, did a film on economics and unemployment, and advocated reform of the patent law. These political and economic concerns were about the way a dehumanized understanding of science was supporting totalitarianism and centralized government control of science in democratic societies. Everywhere Polanyi saw a mistaken view of science as impersonal and strict detachment denying the importance of personal and shared values. In 1946 he published *Science, Faith and Society,* which set forth a new philosophy to refute

scientific objectivism and to restore belief in commitment to the independence of thought guided by the principles of liberty. This paramount problem and Polanyi's grasp of it led his university in 1948 to offer him a chair in social thought in exchange for his chair in physical chemistry.

In 1951 and 1952 Polanyi gave the Gifford Lectures that became his magnum opus, *Personal Knowledge: Towards a Post-Critical Philosophy* (1958). In a comprehensive treatment of human knowing he proposed overturning the last three centuries' habit of thinking that our most genuine knowledge is found by a method that separates the observer from the subject of study and proceeds by neutrally collecting data and drawing conclusions from it. Instead, Polanyi showed from the practice of science that discovery of scientific reality is guided by a passionate dedication nurtured by a conscientious community of inquirers. He upheld objective knowledge as "personal knowledge" because it involved human participation in strategic and significant ways. Polanyi's view meant that the most exact facts could not be separated from the values of the knower and the traditions that guided them. The foundations of a free society that saw the truth of reality as independent of people yet found by individuals seeking the truth, stating their findings, and establishing agreement by open discussion are fundamental to the pursuit of science and knowledge generally. Many modern ideologies had produced totalitarianism and nihilism by a belief in naked truth separated from moral convictions that called for respect for persons and ideals.

Polanyi's proposal gained international attention, and he lectured at many universities throughout the world. His theory meant that the truths of science, religion, and art shared a common ground. In 1958 he became senior research fellow at Merton College, Oxford University. Despite the wide recognition he attained in the intellectual world, academic philosophers sometimes ignored Polanyi as too comprehensive and not specialized enough. Polanyi refined his view into a theory called "tacit knowing" that showed more specifically the personal component with its faith-like structure and its decisive role in the nature of all knowing. In the United States and Great Britain societies pursuing Polanyi's thought have developed on a multi-field basis.

Further Reading

Besides the books mentioned in the article, other major works of Michael Polanyi are: *The Logic of Liberty* (1951), *The Study of Man* (1959), *The Tacit Dimension* (1966), and, with Harry Prosch, *Meaning* (1975). Works about Polanyi are: Richard Gelwick, *The Way of Discovery: An Introduction to the Thought of Michael Polanyi;* Paul Ignotus et. al, *The Logic of Personal Knowledge;* Thomas A. Langford and William Poteat, editors, *Intellect and Hope* (1968), and Harry Prosch, "Michael

Polanyi, " *The International Encyclopedia of the Special Sciences,* vol. 18, David L. Sills, editor (1979). □