

THE POLANYI SOCIETY

Vol. XI, Number 1, Fall, 1983

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TOWARDS A POLANYI SOCIETY PERIODICAL

With this issue of our newsletter, we are experimenting with the possibility of developing a modest periodical that would provide space for longer communications and articles than at present. The inspiration for this approach comes from our counterpart in Great Britain, Convivium, which adopted this format several years ago. By using a format similar to Convivium, we will also be able to reproduce more conveniently copies of material in that publication. We made an agreement with Convivium earlier to exchange newsletters and to borrow freely from each other for the benefit of our members.

Several points of policy will need clarification for this periodical to progress. First, should we have a name for the periodical? If so, what should it be? Second, do we have among us enough willing persons to provide the short articles and reviews suitable for a periodical? The intent of the original Polanyi Society and its newsletter was to provide for news and exchange of ideas. Do the members want to participate at the level of producing the material for a periodical? Third, should and will the present co-ordinators serve as editorial and advisory group as well as leaders in developing the periodical? Other questions will arise but these are some basic ones.

Assuming a subscribing membership of 65 persons, I believe that we can manage a budget for two issues a year of about 40 pages each issue. This increased space could make possible a much more active publication and discussion of ideas. Please address your preferences and suggestions to me.

Richard Gelwick

POLANYI SOCIETY AT
AMERICAN ACADEMY OF RELIGION, DEC. 19

A three hour pre-meeting session has been scheduled for The Polanyi Society on December 19 (9 a.m. Loews Anatole Dallas in FLEUR-DE-LIS A), the first day of the AAA annual meeting. Persons arriving on December 18 will receive the annual meeting discount rate at the hotel.

Richard Gelwick, General Coordinator of The Polanyi Society, and I have conferred in planning the upcoming session. Below is a tentative agenda:

- A. Report on the state of The Polanyi Society
 - Regional conferences: Kent State University, March 8-9, 1984, co-ordinator, Raymond Wilken
 - Discussion of plans for future AAR annual meeting functions
 - Data and bibliographical storage
- B. Publication of materials by Polanyi's Society members. Plans for a periodical and book series by members.
- C. Preview of AAR papers: A number of persons involved in the AAR Polanyi Studies Group are making presentations at the Dallas AAR meeting. This will be an opportunity for a brief review of these papers. Presenters should provide me a copy of a brief abstract by Dec. 1. Oral presentations will be limited to 10 minutes in order to accommodate as many persons as possible. Copies of papers may be distributed.
- D. Abstracts of work in progress or other papers. Presentees should provide me a summary or abstract by Dec. 1. Oral presentations will be limited to 10 minutes in order to accommodate as many persons as possible. Copies of papers may be distributed.

Until recently the American Academy of Religion regularly granted several members of the AAR with interests in Polanyi's work a program section at the AAR annual meeting. Due to space limitations, this policy ended in 1982. Since that time the structure of the AAR meeting has been somewhat re-organized. I was advised, as coordinator of the former Polanyi Studies Group, to apply in 1983 for meeting space under the rubric of The Polanyi Society as an independent scholarly association. Although this is an early time for a meeting, it is an opportunity to gather for those who are interested in Polanyi and are planning to attend the AAR.

I look forward to seeing you in Dallas.

Phil Mullins
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NEWS AND NOTES

Sound tapes of Michael Polanyi's McInerney lectures, University of California, Berkeley, 1962 are available from the Pacifica Tape Library. The titles of the four lectures are: "Destruction of Reality," "Realm of the Unspoken," "A Society of Explorers", and "Vindication of Realities."

Harry S. Broudy, Professor of Education in Teachers College Record discusses "Tacit Knowing as a Rationale for Liberal Education." Broudy observes that two criteria used for evaluating schooling are ability to recall the contents of instruction and the ability to apply specific knowledge to a problem, such as physics to the "remediation of an automobile function." These criteria miss one of the major contributions of liberal arts education, namely its latent creativity brought to effect as we solve unforeseen problems. Broudy discusses "tacit knowing" in this context. Broudy as indicated above will be a keynote speaker at the Kent State conference.

Ronald Hall has published "The Role of Commitment In Scientific Inquiry: Polanyi or Popper," Human Studies, Vol. 5, No. 1 (March, 1982). I have not seen a copy. (Please help us, Ron.) This news came through Phil Mullins. Ron is at the Philosophy Department, Francis Marion College, Florence, SC.

Edward Echeverria is now teaching as Senior Lecturer in Philosophy at Rhodes University in South Africa. His address is Rhodes University, PO Box 94, Grahamstown, 6140 South Africa. His published dissertation was missed in our bibliography in the winter, 1963 issue of the Newsletter, though reported earlier, because that bibliography was done by a computer search for titles using Polanyi's name.

Jere Moorman, M.B.A., 1259 Hornblend Street, #7, San Diego, CA 92109 has privately published a booklet, Polanyian Meditations. The booklet is the outgrowth of a Polanyi study group led by well known Rogerian psychologist Bill Coulson. In humorous manner, the booklet expresses many of the insights of Polanyi in aphorisms and cartoons. Below is a selection from the cover page.



ALL PERSONAL KNOWING
APPRAISES WHAT IT KNOWS
BY A STANDARD SET TO ITSELF.

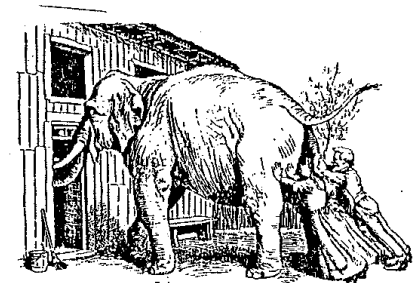
Appeal Judge Robert P. Smith, District Court of Appeal, Tallahassee, Florida, 32301 and Ruel Tyson, well known personal student of Michael Polanyi, Professor of Religion, University of North Carolina at Chapel Hill are collaborating in the development of a project relating Polanyi to the decision making problems of Judges. Presently they are developing support for a major conference that will bring together judicial leaders on the theme "Judging Judgment: Harmonies For The Writing Judges."

Two articles co-authored by our Polanyi Society Co-ordinators of Art and of Religious Studies, Doug Adams and Phil Mullins, have been published. Both articles are based on papers presented at AAR meetings. The first article is "Meaning With The Arts: Implications of Polanyi's Epistemology For The Arts," Pacific School of Religion Bulletin, Vol. LXI, No. 2, June, 1983. The other article is "Conscience, Tacit Knowledge, and the Art of Judgment: Implications of Polanyi's Thought For Moral Reflections." LXVI, Soundings 34, Spring, 1983.

Prof. Robert T. Osborn, Department of Religion, Duke University has had published in THE JOURNAL OF THE AMERICAN ACADEMY OF RELIGION, Vol. LI, No. 1, March, 1983 a revised version of his earlier AAR paper on Polanyi and liberation theology. The later paper entitled "Some Problems of Liberation Theology: A Polanyian Perspective" sees the new element in liberation theology in "its insistence that the concrete historical situation or context of the theologian plays an essential, hermeneutical role." It then develops two propositions: "(1) that liberation theology as a way of knowing in which the context plays an essential role suffers peculiar problems and confusions, and (2) that Michael Polanyi's theory of knowledge, with its analogous focus on the personal and bodily 'indwelt' context of knowing, provides some critical perspectives with which to clarify and resolve some of the problems common to all who understand themselves as liberation theologians." (p. 79)

APPRECIATION OF A PROBLEM

From: Moorman,
Polanyian
Meditations



To see a problem is a definite addition to knowledge, as much as it is to see a tree, or to see a mathematical proof—or a joke. It is a surmise which can be true or false, depending on whether the hidden possibilities of which it assumes the existence do actually exist or not. A recognized problem which can be solved and is worth solving is in fact a discovery in its own right.

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POLANYI CONFERENCE AT KENT STATE
March 8 - 9, 1984

Theme: "Knowing In Action: Michael Polanyi
and the Educational Process

The College of Education at Kent State University in cooperation with The Polanyi Society will hold a conference Thursday and Friday, March 8-9, 1984, to celebrate the works of Michael Polanyi, to share recent developments and research related to Polanyi, and to extend the implications of his philosophy to the field of education.

The conference will begin Thursday evening with a dinner and meeting honoring the Polanyi Society members. Afterwards, Professor Harry Broudy, Philosophy of Education Emeritus, University of Illinois, will address Polanyi Society members and a KSU audience on "Uses of Knowledge." Professor Broudy is widely recognized as an eminent educator. His work parallels that of Polanyi, and he has been eloquent in developing and extending Polanyi's concepts to the educational community. An example of this can be seen in his article "Tacit Knowing as a Rationale for Liberal Education," *Teachers College Record*, February, 1979, Vol. 80, No. 3, pp. 446-462, and in his recently published book *Truth and Credibility: The Citizen's Dilemma* (Longman, 1981). This book was reviewed by Robert Beck in *Educational Theory*, Spring, 1981, Vol. 31, No. 2.

On early Friday morning there will be an "abstract session" where Polanyi scholars will offer a report of their current work and distribute papers. In the afternoon, from 3:30 - 4:30 there will be an opportunity to meet with these scholars to discuss their work. There will also be a roster of Polanyi scholars present and a resource center for making appointments to talk with them.

On Friday, March 9, presentations will be made by Professors Richard Gelwick, Maxine Green, Donald Campbell, and Avery Dulles. Professor Gelwick is one of the more prominent and informed interpreters of Polanyi's work and certainly is no stranger to the Polanyi Society. His theme will be "Catching Knowing In Action, Polanyi's Discovery." Maxine Green, Professor of Educational Foundations, Teachers College, Columbia University, is one of the most sought after speakers in Education. She is remarkable in her grasp of many disciplines--especially philosophy and literature. She will speak on "The Humanities in Education."

Even with an already crowded schedule, Donald Campbell, Professor of Social Relations, Lehigh University, is eager to address this conference, in order, as he stated it, "to meet other Polanyi enthusiasts." Professor Campbell has unique credentials. He has spent extended periods of time with Polanyi both at the University of Chicago and at Oxford University. He is also a former president of the American Psychological Association. His topic will be "Michael Polanyi's Epistemological Sociology of Science and its Implications for Educational Research."

The Rev. Avery Dulles, S.J., theologian at Catholic University in Washington, D.C. will contribute to the religious implications for education by speaking on "What Polanyi Has Meant To Me As A Theologian." Professor Dulles is one of the most respected Catholic theologians in North America today.

After these presentations, the group will adjourn to lunch, following which the guest speakers will interact with each other in a panel and entertain questions and comments from the audience. Following the afternoon sessions with the individual papers, the conference will end at about 4:30 P.M. Friday.

The conference will be held at Kent State University campus in Kent, Ohio. Kent is approximately 40 miles Southeast of Cleveland and 12 miles Northeast of Akron. Both Cleveland and Akron have commercial airports. Where necessary KSU will provide transportation to and from the airports.

The University and the City of Kent have ample housing available for guests. It is hoped that most of the conferences expenses for Polanyi Society members can be met by Kent State University.

Brochures of the conference will be mailed to Polanyi Society members and others early in January. Plan now to honor the work of Michael Polanyi and to share in what will be an exciting and informative conference.

Raymond Wilken
Conference Coordinator
Educational Foundations Department
Kent State University

TWO KINDS OF AWARENESS



Subsidiary awareness and focal awareness are mutually exclusive. If a pianist shifts his attention from the piece he is playing to the observation of what he is doing with his fingers while playing it, he gets confused and may have to stop. This happens generally if we switch our focal attention to particulars of which we had previously been aware only in their subsidiary role.

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From: Moorman, Polanyi Meditations

JOSEPH AGASSI ON POLANYI'S
PHILOSOPHY OF SCIENCE

Joseph Agassi, Faculty of Humanities, Tel-Aviv University, Israel has published a major discussion of Michael Polanyi's philosophy of science entitled Science and Society: Studies In The Sociology of Science (D. Reidel, 1981). "Dedicated to the memory of Michael Polanyi," the following is the preface:

"This, my second volume of selected essays, has Michael Polanyi as its hero and target of criticism. My first volume had Popper serve the very same function. It is not surprising, perhaps, that as a former student and disciple of Popper, I commented so much on his work. In retrospect I was surprised to find how much I commented on Polanyi; I realized only then how much I was indebted to him not only as a kind elder colleague who was so gracious as to waive his seniority but also as a challenging thinker indeed. I repeatedly express my admiration for both of these thinkers as the two outstanding philosophers of the mid-century; I take their concern for the progress of science to be their major asset, and I regard their view of science as a social phenomenon as the hallmark of contemporary avant-garde philosophy. I cannot think of any of their contemporaries who influenced as profoundly the current climate of opinions about science and its significance and its social character, except for Sir Edward Evans-Pritchard and Robert Merton, and no doubt Polanyi has taken cognizance of their contributions.

"The fundamental concern shown by both Popper and Polanyi is for science as part and parcel of our culture and of our society. Science is traditionally characterized both by its method and by its products. Popper chose to stress the method rather than the products; and he brought to the fore the social character of science by the added assumption according to which scientific method is a product of social conventions, i.e., is a social institution. Polanyi chose the social aspect of science as primary, and deemed the methods practiced by its members as secondary. The difference is subtle but of extremely divergent consequences. Suppose scientists agree somehow to change their methods most drastically. Will this kill science as we know it? Popper will say, if and only if they cease criticizing themselves and each other, then, yes, science as we know it will thereby be over. Polanyi will say, if and only if the change be so radical that continuity will no longer be preserved, then, yes, science as we know it will thereby be over. Now, clearly, neither belittles either criticism or continuity. And both recognize this fact. Indeed, Popper speaks of the continuity of the critical tradition, and Polanyi of criticism that maintains flexibility and so fosters continuity.

"Were it not so difficult to distinguish Popper and Polanyi, Imre Lakatos, who was a sharp and acute thinker, would not be able to slide from being a disciple of the one to the other. I remember one evening devoted to this point at the Brandeis University Philosophy Club with the late Harold Weisberg in the Chair. Lakatos was the speaker and I was a commentator, replacing Paul Feyerabend who failed to show up. Lakatos' punchline was, but if Polanyi only could understand himself well enough, he would not fail to notice that he is a true Popperian. The remark brought the house down: Lakatos could be trusted to bring out funnily the funny side of important matters.

"It was fortunate for me that though Popper and Polanyi were the two great opponents in England when I went there for my studies, they each appealed to the better side of the other, no matter what the other's philosophic stand on the matter was. Thus, though Popper preached we should engage in critical debate only with fellow rationalists, he debated with post-critical Polanyi who,

though he preached we should engage in debate only with fellow main-stream thinkers, debated with heretic Popper. For, I was thus able to enjoy the benefit and the pleasure of the company of both of them. This raises a general question: is there a limit to toleration and is toleration a necessary or a sufficient condition for critical debate? Or, we can switch words and ask, is there a limit to critical debate and is it a necessary or a sufficient condition for toleration? And are these two qualities similarly related to scientific progress? If we cannot have all three, which should we give up? Any one who both appreciates and dissents from both Polanyi and Popper is bound to ask, what is the order or priority of toleration, criticism and scientific progress? And priority here may be regarded both morally and socially. I hope the present selection of essays will help support my plea for putting this concern high on the agenda, perhaps also for clarifying its background somewhat and pointing at some possible corollaries. Let this be my homage to a great thinker. I hope my harsh criticism is relevant and is thus conducive to the noble concerns he showed in all his writings.

Tel-Aviv, Winter 1980

JOSEPH AGASSI

P.S.

"Paul Feyerabend has recently (Inquiry, 1980) branded Michael Polanyi an elitist and a Stalinist on the authority of Imre Lakatos, who had used the labels 'elitist' and 'Stalinist' interchangeably. And perhaps Lakatos was an authority: not only do Feyerabend and I agree he was both an elitist and a Stalinist; Ian Hacking too, it seems, in his extended review of Lakatos's posthumous collected works (British Journal for the Philosophy of Science, 1980), expressed pretty much the same view. Yet there is a paradox here: should we trust an expert Stalinist as an expert, or should we distrust him as a Stalinist? (Following Lakatos and Feyerabend I consider here Zhdanovism as part and parcel of Stalinism with no specific reference to it.)

"This question may be dismissed by Popper, who said, rather naively, never trust an expert anyway. It was central to Polanyi, who said, the expert is an indispensable ingredient: he is the connoisseur whose taste is so very much superior to that of the inexpert, that we will lose much if we fail to utilize his good offices. Nor was Polanyi insensitive to the possibility of the expert abusing his power. He declared the abuse regrettably unavoidable, but recommended it should be controlled lest the scientific tradition be disrupted. This is why, when Stalinism was rampant and its program of planned science popular in the community of science, Polanyi was far from relying on expert judgments on planned science; rather he worked indefatigably to organize the Congress of Cultural Freedom and the Committee on Science and Freedom. These organizations played a significant if quiet role immediately after World War II, especially in Central Europe before the formation and consolidation there of political parties proper. Whatever history will pronounce as a judgment on these organizations and their political activities, it should be noted that Polanyi was dedicated to the cause of intellectual freedom. This made him abandon his prestigious chair in physical chemistry for a chair in sociology. It might also be noted that his judgment of his misguided colleagues was benign to the end: in 1956, soon after the revolution, in the 20th Congress of the Bolshevik Party, of the Stalinist atrocities, Polanyi still viewed the acceptance of Stalin as based on the nationalization of industry and his attraction as rooted in "the messianic claims attached to this measure by Stalin's followers". (The emphasis is in the original.) This judgment contrasts rather sharply with George Orwell's view of the popularity of Stalin among intellectuals as power-worship proper.

"Despite Polanyi's great sensitivity to human suffering, he declared the authority of the expert binding without fooling himself or his audience: he was clear about the fact that authority wields power and can abuse it. He clearly distinguished between the external authority of the politician, which he sharply opposed, and the internal authority of the scientific leadership which he endorsed. Yet he was clear about the fact that the internal authority wields power and can abuse it too. He demanded the control of power and devoted much of his career to this task. Yet, this control has no room in his philosophy. The reason is simple: the desired control of power is democratic. Nor is there a discussion of democratic control in other writings on the philosophy of science that I know of, except for a remark here and an admission there. The critical philosophy of the Popper brand is conducive to it, yet Popper's own philosophy still includes the myth of the unanimity of science and brands as pseudo-scientific all scientific disciplines where controversy is a flame. The very preoccupation of Popper with pseudo-science is elitist. This elitism did not mix well with the democratic social philosophy of Popper. Indeed, it goes better with the democratic social philosophy of Polanyi. It is therefore not surprising that Polanyi grudgingly endorsed Popper's idea of pseudo-science, though with his usual reservation that the scientific elite can overrule any of its accepted criteria. It is therefore even less surprising that the Stalinist Lakatos tried to offer an explicit elitist criterion of demarcation of science from pseudo-science (see the note by myself and Charles M. Sawyer 'Was Lakatos an Elitist?', Ratio, 1980) plus the demand to suppress pseudo-science, which demand will be discussed in later chapters in this volume.

"The message of the present volume is this. Science will do better and be more humane if the (inner and outer) democratic controls of the commonwealth of learning improve, become more effective, and apply to wider areas. In discussing this I find it necessary to criticize both Popper and Polanyi. Unlike Feyerabend, however, I try to take note of their devotion to the cause of freedom and democracy. Their advocacy of self-censorship of the commonwealth of learning is understandable, but dangerous and contrary to the very spirit of democracy that obviously does permeate all their writings: it is more important to criticize the undemocratic tendencies present in the writings of avowed democrats like Popper and Polanyi than the very same tendencies present in the writings of advocates of suppression and violence like Lakatos and Feyerabend.

"In this, I think, I am a follower more of Popper than of Polanyi, since Polanyi viewed all dissent as strife and Popper deemed critique as homage. Let my respectful dissent from and critique of both Popper and Polanyi count as my homage to these great philosophers and as my expression of admiration to the spirit of democracy which permeates their writings. On this ground I deem all my criticism of their writings internal criticism."

The length of this work and the stature of Agassi merits a critical review. We would welcome a 2000 word review. Any volunteers?

RG

POLANYI LECTURESHIP
ESTABLISHED AT UNIVERSITY OF NORTH CAROLINA

A retired physicist from the University of North Carolina at Chapel Hill has given the University \$20,000 to endow a biennial lectureship in the history and philosophy of science.

Dr. Waldo E. Haisley, Jr., professor emeritus of physics, said he established the Michael Polanyi Visiting Lectureship because he was concerned that scientists have become so preoccupied with their research specialties that they sometimes lose sight of science's larger aims.

It seems to me that in my lifetime, scientists have become more and more specialized and have lost some of their perspective on the goals of science," Haisley said. "I hope this lectureship will stimulate people to be interested in the large aims and philosophy of the scientific enterprise."

Every two years, the Polanyi visiting lectureship will bring a scientist of international reputation to the UNC campus for a week. The scientist, who will receive \$3,000 for the visit, will interact with faculty and students, conduct seminars and give one public talk.

Dr. Freeman J. Dyson, a distinguished theoretical physicist at the Institute for Advanced Studies in Princeton, N.J. has been selected as the first Polanyi lecturer, Haisley said.

Dyson lectured at UNC September 19-23 and presented a talk titled, "Infinite in All Directions" Wednesday evening, September 21 in Hamilton Hall.

"I named the lectureship in Polanyi's honor because of his great influence on scientists and philosophers and because of the personal benefit I received reading his work, listening to his lectures and talking with him during his year of residence at Duke University," Haisley said.

Polanyi was visiting professor at Duke during the 1963-64 academic year, and in 1964 he delivered the annual Sigma Xi lecture at Chapel Hill.

FROM Convivium, No. 17, Oct., 1983

ON GETTING TO KNOW
Part of a paper on Polanyi and Education,
given at the Higher Education Group Conference, 1983.

When you travel in high mountains you spend a good deal of time plodding up glaciers and across ice fields. It is relatively easy going, though crevasses can be dangerous when they are masked in snow. The whole immediate world of ice and snow is moving, imperceptibly and relentlessly down hill. Around the upper edges of these snow basins there is usually a long, crescent-like chain of crevasses - the bergschrunn - which can be a serious obstacle to mountaineers. Above this again and cut off from the restless down-flowing snow and ice fields is a steepening zone of rock and ice which runs up the high peaks. This world, though hazardous, is not mobile, as were the ice fields below the bergschrunn. At the crevasse itself which separates the two worlds there are special problems and the climber will be on the look out for a natural snow bridge, leading upwards over the blue abyss. It can be a tricky business for him to pick the best way over - kicking, probing with his ice shaft and cutting steps. The slopes above may be, in one sense, more firm but they are shattered and exposed. Retreat is less easy; commitment and good judgment are necessary. From this one could squeeze out many analogies to our present dilemma but the main ones will be evident, especially the problematic divide between the prevailing 'downward' world view with its sliding relativism and the bridge across to something more permanent and more demanding; a bridge which we both find and make.

C. S. Lewis coined the term 'the great divide' to describe the conceptual

chasm which yawns between us and - his chosen marker - Jane Austen, between our epoch when thinking and feeling have been dominated by the metaphor of the machine which runs down, and the rest of history.¹ One can view the chasm through many eyes: early on through the eyes of Blake, Coleridge or Goethe or, helped by recent critics, one can see it as George MacDonald or Newman did a century ago;² or as T.S. Eliot did in the nineteen twenties,³ Fergus Kerr recently took readers of New Blackfriars on a lightning tour of some of the twentieth century thinkers who had been aware of the great divide, and of some who weren't.⁴ He describes, for example, the rupture which took place between Bertrand Russell, a typical 'logical atomist', on the one hand, and D.H. Lawrence and Ludwig Wittgenstein on the other. Kerr suggests that Wittgenstein should be regarded as the bridge builder par excellence, for he made all his 'upward' moves in the very centre of the philosophical scene, where the issues were sharpest, the ground steepest. The later Wittgenstein, of the Philosophical Investigations, certainly rounds on his own past thinking and on that of other reductive philosophers whose habitual search was for little atoms of clear meaning. Wittgenstein does not revoke his past thought entirely but fits it into a larger, less secure framework. Thus:

We feel as if we had to repair a torn spider's web with our fingers... (The crystalline purity of logic was, of course, not a result of investigation; it was a requirement.)... We have got on to slippery ice where there is no friction and so in a certain sense the conditions are ideal, but also, just because of that, we are unable to walk.... So we need friction. Back to the rough ground!⁵

Kerr paints a nice picture of another Cambridge maverick, panting up the slope, F.R. Leavis, who had spent thirty years ignoring Wittgenstein's teaching. Then, browsing one day in Heffer's, he stumbles on an adequate, non-reductive philosophy in Marjorie Grene's The Knower and the Known and this leads him to Michael Polanyi.⁶ In my opinion Kerr is too dismissive of both of them and he is wrong to treat Polanyi as peripheral. As, however, we do not have to cast votes in a Top Guru Competition, we may, perhaps, acknowledge indebtedness to all those bridge builders. One of the reasons why Marjorie Grene and Polanyi are still important is their interest in biology and in the groping origins of life, of consciousness and of language. I must say that, as a schoolmaster, searching for friction and rough ground in the nineteen sixties, I was immensely grateful to both for their friendship and their marvellous books.

Polanyi opened up an approach to a new and liberating way of thinking about education - about knowing and helping others to know. The difficulty was, and still is, that he requires teachers and others interested in education to think in a new and complex way - to think about processes and living systems, about fields and boundaries within which people (ourselves included) form active constituent parts. Not only do we need multi-causal models for such processes but we need also to cultivate a rationality of involvement as well as a rationality of detachment.

Polanyi's thinking about the learning process was in step with many of

Plaget's findings about early cognitive development and it often echoes one's own memories of childhood exploring; but it does not conform to the conventional thought models which derive from mechanistic psychology - what Popper calls 'the bucket theory' of learning. Nor is Polanyi in step with the prevailing and predominantly analytic philosophy of education. He reminds us that we can be agents of our own learning and that people can act with a measure of freedom and can change their inhospitable environment and, even more important, they can transform their total perception of the cultural field which constrains them.

I propose - following several good precedents - that we take the concept of a field and develop it. The concept started its scientific life in physics and was then pushed up into biology. We shall push it further 'up' into developmental psychology and education. We can start the move with Polanyi where at the end of Personal Knowledge, he speaks of 'a gradient of discovery'. It is as though we, the scientist or the young explorer, are committed to 'the slope' and to the values implicit in it before we can make any discovery. Notice, too, that such upward model-pushing is in itself antireductive; a rational man must be free to borrow concepts from, say, physics or chemistry or cooking and to exploit them at other levels without saying 'nothing but'.

Polanyi's Concept of a Heuristic Field

What kind of things happen when you or I move into a field of discovery and begin to find or make our way there? What is the shifting nature of our perspective when we are thus involved, or of others when they watch us? What about the things we use in an act of discovery or which we construct to help us - probes, say, or hypotheses? And how does it come about that toys sometimes become tools or - to turn in a more Coleridgean direction - that our toys or 'play withs' become 'explore withs'?⁷ Words are notorious for this protean quality. A metaphor starts life as a play thing, glitters for a while with poetic freshness and later becomes a convenient routine or a cliché. As children we learn all this by experience: that many of our cultural things and projects pass through stages of being fun, of being dangerous, of being boring. Yet as adults and as teachers, we are only beginning to understand the dynamics of such transactions.

Even though much of Personal Knowledge had been leading up to the idea of a heuristic field, Polanyi seems a little unconfident about it. For forty years, first as a doctor then as a physical chemist he had experienced fields of enquiry but he is well aware that the theoretical ground is treacherous, that terms such as 'lines of force', 'fields of influence', and telic phenomena in general, need careful handling. This is how he introduces the concept:

The lines of force in a heuristic field should stand for an access of opportunity, and for the obligation and the resolve to make good this opportunity, in spite of its inherent difficulties. The idea of such a field suggests... that our expectation to discover truth is justified by our nature as living beings. It asserts the fact that knowing belongs to the class of achievements that is comprised by all forms of living.⁸

Some might say that there were problems about Polanyi's suggestion that all living organisms are 'exploratory' in tendency. We should be in no doubt, however, that human beings are so characterised, and that 'personal knowledge' needs to be understood as a continuously renewed, integrative and creative process. That is the insistent thread of much of Polanyi's teaching. He returns, again and again, to the question of what constitutes a creative act of enquiry and he illustrates his answer with examples from scientific discovery, from the work of connoisseurs, artists and explorers.

Karl Popper, in contrast to Polanyi, tends to take the early, intuitive processes of discovery for granted and is mainly concerned with how new ideas and new hypotheses, once they have emerged, can be shared, developed and exposed to refutation.⁹ Polanyi knew only too well the false starts, the long periods of groping and gestation during which problems are identified and models and hypothesis are generated. In The Tacit Dimension he identifies four more or less distinct stages in the 'getting to know' process and what follows is, in summary, his analysis of what goes on in one person's heuristic field.¹⁰

Firstly we bring our skills, our experience and attitudes to bear on an oddity or anomaly in the patterns which especially interest us. We then seem to be on the edge of a field of doubt and possible discovery. We recognise it and start to work on it. Polanyi calls this the functional stage for it is our functioning competence, our range of appropriate skills and perceptual schemes which locate the problem and initiate the task.

Secondly, over a period of time we work at the task, with the materials and equipment which seem appropriate to it - a loom, say, or a microscope. As we do this, both expected and unexpected forms appear. This is what Polanyi calls the time of appearances, the phenomenal stage. It is often long drawn out and will be characterised by feelings, such as hope, perplexity and doubt.

Thirdly, there comes a stage when, with good luck, some overall pattern begins to emerge. This is the 'aha' moment when things fall into place. Polanyi terms it the semantic stage, using the analogy of someone hearing a nearly complete sentence. It is when meaning clicks into consciousness.

Finally, there is a stage which may last beyond the life of any single explorer or artist. It is when his or her discovery is progressively checked out against reality. Polanyi calls this the ontological stage for, insofar as a work of discovery or of art is 'true', its truth will be validated against the partly hidden but still unfolding realities of the universe.

Briefly, then, we bring our functioning competence to bear on a task; expected and unexpected phenomena appear; after a time some new overall, integrating pattern is perceived and, subsequently, we and others fill out, falsify or stretch to breaking point, that pattern which we once had a hand in discovering.

Polanyi's way of thinking about an explorer's passage through the stages of discovery generalises the experience of many creative craftsmen, poets and scientists. However, for the purpose of thinking about discovery in education, his analysis is insufficient. It omits, or only hints at, several elements which are essential for an adequate conceptual model of what actually goes on. The missing elements are:

Firstly, the teacher who has already travelled part of the way. In research (properly understood), as opposed to education, there will be no teacher. There will be an enquiring learner and he may have colleagues; but there is no one who already knows the hidden structure.

Secondly, play. Polanyi hints at it, but does little to extend our understanding of this crucial concept.

Thirdly, frontiers. These too are implied by Polanyi but the existential reality of the learner's own perceived limits is not discussed by him.

Fourthly, symbols. If we are to understand the power - both repellent and attractive - of symbols we need to turn to authorities other than Polanyi. Even in his last book, Meaning, which has much to say about metaphor, he does not assign to either verbal or non-verbal symbols their powerful heuristic function.

As far as education goes, we are still tied down, with a rather mean view of what most young humans can achieve. We are also tied down with a very limited and limiting philosophy about what education is. "Education," says Richard Rorty "is supposed to be abnormal, to take us out of our old selves by the power of strangeness". Yes, I think we are making a little progress towards the steeper, rougher ground.

R.A. Hodgkin

Notes

- 1 'De descriptione Temporum' in They asked for a paper (1962).
- 2 Swiatecka, M.J. The idea of a symbol (1980) Ch. 2.
- 3 Coulson, J. Religion and the imagination (1981).
- 4 September, 1982.
- 5 Philosophical investigations, (1953) p. 46.
- 6 F.R. Leavis, The Living Principle (1975) pp. 16-69. He discusses Grene's The Knower and the Known (1966) and Polanyi's Knowing and Being (1969), especially the latter's 'sense giving and sense reading'. This paper of Polanyi's has especial relevance as, in it, he discusses Chomsky's ideas about linguistic competence and stresses the importance of some looseness (i.e. of play) in the processes which precede linguistic utterance.
- 7 'The first man of Science was he who looked into a thing, not to learn whether it could furnish him with food or shelter, or weapons, or tools, or ornaments, or play withs, but he who sought to know it for the gratification of knowing; while he that thought to know in order to be was the first philosopher: Anima poetiae 1814.
- 8 Personal Knowledge (1958) p. 403 (Polanyi's emphases).
- 9 For a recent statement, see his Objective Knowledge (1972), Chs. 1 and 2. Both Popper and Polanyi accept that a person's knowledge includes vast genetic and other deeply buried layers of information. Polanyi's concept of tacit knowledge includes this as well as accessible knowledge and he attributes to the whole a guiding influence which Popper does not. In a paper of mine, 'Making sense and the means for doing so' Pre/Text (1981), I defined competence as a relatively accessible, educable part of tacit knowledge. It was not possible to repeat this in the present paper.
- 10 (1966) Ch. 1, 'Tacit knowing'. Polanyi generally preferred the present participle - 'knowing' - to 'knowledge' because it stresses the process aspect of 'getting to know'.

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MICHAEL POLANYI ON REDUCTIONISM

In 1967, the World Council of Churches and the World Council of Christian Education published a Report entitled Education and the Nature of Man. Amongst the appendices to the main report is one which was written by Michael Polanyi personally. Prof. W.R. Niblett has kindly allowed this to be reproduced in Convivium, pointing out that these six short paragraphs under the heading of Reductionism provide an excellent Summary of his general position.

1. Our educational task is set in a culture which tends to accept as real an image of the universe reduced to its tangible parts. We believe this to be misleading. An understanding of a comprehensive entity rests on our integration of its parts. Hence the isolation of the particulars blinds us to the sight of the whole; the image of man and human affairs is denatured by such a destructive act. The alternation of detailing and integrating is an essential method of elucidation in many fields; but our education must remember the fact that the essence of man lies in his highest faculties and responsibilities of integration and response.
2. The urge to represent the world in terms of its ultimate particulars springs from the ideal of a strict scientific detachment. But to comprehend a coherent entity is to interiorise its parts, while attending focally to the whole; hence to avoid such interiorisation is to destroy comprehension and be left with the isolated parts. Thus the pursuit of strict detachment produces exactitude at the expense of meaning.
3. Various modern systems of thought are open to this criticism. A sociology which would insist that the recent struggle of the American Negro must be explained without acknowledging the moral issue involved in it, is manifestly absurd. And again, when some Western universities and along with them the Western press explains the revolutionary demand for truth, for the rule of law and for the freedom of conscience, in the lands of Eastern Europe, as the normal outcome of progressive industrialisation, this attempt at scientific detachment blinds one to a decisive event of history.
4. A human being, making a responsible decision and dedicating himself to action, can be understood only by responding to his situation as if it were one's own. Systems of explanation which would avoid such involvement, must fail, and fail miserably.
5. This process of indwelling applies to all levels of knowledge. Indwelling recognises a hierarchy of levels in the universe. Each higher level operates by controlling the boundaries left indeterminate by the principles of the level below it, the lowest level being that of the ultimate particles of

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matter ruled by the laws of physics. Rising levels add a deeper meaning to the whole and demand a deeper participation for understanding them.

6. This offers hopes of a cosmic perspective in which we can once more place first things first; the living above the inanimate, man above the animal, and the duties of man above man.

THE HIGHER EDUCATION GROUP AND REDUCTIONISM

Here is a condensed account of a considerable series of papers and discussions on 'Polanyi related' themes by a very diverse group of academics. Most of the papers have been published or will become available in duplicated form.

During 1982-83 the HEG planned a series of three meetings on this theme - one at Exeter and two at St. Anne's College, Oxford. Special attention was paid to the influence of reductionism in biology, medicine and psychology. From the first there was little disagreement that reductionist thought can be of great value to scientists when it is a consciously adopted strategy. This is what Arthur Peacocke termed 'methodological reductionism'. Problems occur when its claims are extended - when one moves to 'epistemological reductionism'. For example, in what sense is knowing physics more fundamental than knowing chemistry? A third, more imperial type of reductionism was also identified - the 'ontological' brand. This would involve the idea, explicitly held by a few scientists but implicitly held by many, that there really are no basic truths about the universe, other than those which are arrived at by going along the analytical, 'nothing but' line of enquiry. A good deal of time in the first two meetings was spent in exploring these ideas.

The Preliminary Conferences. Anyone familiar with Polanyi's approach would have been in sympathy with Donald MacKay's insistence that 'the "I" story' must play an important part in our understanding of any scientific enquiry or of any other 'free' or creative act. Richard Gregory, while accepting a multi-level hierarchy of dependent systems - the chemical being dependant on, and integrated from, the physical etc. - warned us against intellectual short cuts: against, for example, introducing the notion of mystery when we should be confronting puzzles, or against the ready use of such concepts as emergence.

At the September (1983) Seminar at St Anne's further papers were given or earlier ones were developed. Eileen Barker gave a fascinating account of her work on 'conversion' with special reference to The Moonies. She demonstrated not only the extreme complexity and strength of such conversions but also the tendency which 'society' displays for reducing the reality of such experiences to 'mere' sickness or even to crime: hence the frequent and often psychologically violent efforts of some parents and other authorities at deprogramming young converts.

Steven Rose focussed attention on the several different, legitimate ways of explaining a simple biological event, such as the sudden movement of a frog's leg.

It can be seen as: 1) a mere mechanical event; 2) as the result of some 'top-down' causation - starting with an act of the frog, seen as a whole; 3) as part of some developmental process; or 4) as part of some ontogenetic change in the species. He then developed a critique of the undue influence of reductionism in biology and psychology and offered 'a dialectical alternative'. This view emphasised both the active penetration of the environment by the organism and the importance to be attached to the fact that all the organisms which we observe have long and complex histories. Mary Midgley followed this with a stimulating paper called 'Reduction and the Manufacture of Demons'. She demonstrated the extreme causal complexity of human act and human dilemmas and - with critical glances at Dawkins and E.O. Wilson - attacked the common, illicit forms of reductionism which make people feel that they are under the control of fatalistic, determinant forces - 'the iron (i.e. 'demonic') grip of biology'.

Other papers were given by Arthur Peacocke, Donald Mackay, Adam Morton, Cicely Saunders, Gordon Wright and Mary Hesse.

The Main Conference

Here again I must apologise for a brief sketch. Perhaps the problem of the conference was that at least four different things were going on. There was some important soul-searching by the Higher Education Foundation about its role. Secondly there was some strenuous development of ideas already touched on: Arthur Peacocke and Eileen Barker probed the philosophical implications of their earlier papers. Peter Hodgson - in a vein consonant with Peacocke's approach, though perhaps more dualistic - presented us with a physicist's view of the ultra small - all the way down to gluons. Then, thirdly, there were two literary contributions. Anthony Nuttall sketched, and even inverted, the concept of reduction so that many of those who listened must have wondered whether it is possible to 'reduce upwards' e.g. 'Jesus reduced the complexities of the Law to the simple commands ...'. In contrast to such simplifying we were invited to contemplate the incredible richness of Shakespeare who created a vast cosmos of complexity and human 'overdeterminedness'. (Memories, here, of Mary Midgley.) Then there was a paper by Barbara Reynolds on 'Translating'. She presented an illuminating picture of the translator-artist at work. First she (or he) has to penetrate, imaginatively, far into the experience and ethos of the original writer. Having then explored (of course, only in part) this other artist's tacit world, the translator then sets about recreating the poem or play in her own language. The constraints and the inevitable semantic problems presented by both languages would seem, for the translator, to be as important as her determination to transcend them.

Finally there were two papers which grappled with the question - where might all this be leading? Robin Hodgkin took Polanyi's concept of heuristic field and welded it to Winnicott's concept of potential space i.e. that in which children or other 'explorers' play and experiment. He derived a general educational model

from all this and used it to show how a word (or any other human artefact) can become a symbol when pushed out to the explorer's 'frontier'. Finally Geoffrey Price took us on a strenuous journey in which he used Owen Barfield's idea that knowing any object should involve us in a far greater measure of indwelling or participation (Bruhl's sense) than any 'English' philosopher would be likely to admit. The end of his paper was an approach to Lonergan's ideas (set out in Insight) on what understanding in science should comprise: i.e. both a statistical perspective (= ? conventional and analytic ?) and a systematic (= systems theory = holistic ?) perspective. In the long run, as Barfield and Lonergan suggest, we shall rediscover 'indwelling' - not the limited participation of the primitive (an innocence to which we cannot return) but 'a religious participation' - an active awareness of unity in all phenomena and in all knowing.

R.A. Hodgkin

FROM Convivium, No. 17, Oct., 1983

Springs of Scientific Creativity: Essays on Founders of Modern Science. Edited by Rutherford Aris, H. Ted Davis, Roger H. Stuever. University of Minnesota Press, Minneapolis. 1983, 342 pp.

This book was kindly lent to me by Dr. Magda Polanyi. It is an interesting and scholarly collection of essays ranging from Galileo to Einstein. Polanyi and von Neumann. The twenty-eight page article by William T. Scott is entitled Michael Polanyi's Creativity in Chemistry. We reap the benefit of Bill Scott's exceptionally detailed knowledge of Polanyi's early life, which he needed to acquire for the biography he is currently writing, as well as of his expertise as a scientist, which enables Scott to write with precision and understanding of the whole range of Polanyi's scientific work. For the non-scientist, like myself, who unfortunately cannot enter intelligently into Scott's description Polanyi's research into thermodynamics, adsorption of gases, X-rays, crystals and so on, nor follow the diagrams and formulae, there is the compensation of interesting references to Polanyi's correspondence and dealings with such eminent scientists as Einstein and, at the end, a quite excellent section where Scott sums up the significance of the work Polanyi did after exchanging his chair of physical chemistry for one in the Manchester faculty of Economic and Social Studies. The

essay as a whole skillfully relates the scientific problems which Polanyi studied and the ideas and criteria he developed out of this experience of creative research for thinking about the nature of the world and our position in it. Polanyi's thirteen years at the Kaiser Wilhelm Institute in Berlin were tremendously productive and covered "metallurgy, crystal physics, colloid chemistry, structural chemistry, luminescence, reaction kinetics and catalysis". In 1933, Polanyi moved to England. Scott describes how he came to be offered the Chair in Physical Chemistry at Manchester after an interview in which he "brilliantly discussed crystal structure, physical metallurgy, cellulose, contemporary French literature and detective stories". The variety of his research areas in Manchester was also astoundingly rich, but I will not dazzle the non-scientist with another long list. Suffice it to say that the essay serves to give this profound and sensitive genius the reputation as a scientist he deserves. In the last few pages, Scott shows that Polanyi offers us a new theory of society drawn from his participation in the community of science and a new way of looking at the personal and social process of acquiring knowledge. His insights have significance both for education and for the organisation of industry. As early as 1935, Polanyi was writing about the failure of the Soviets to control their economic system by central planning and he fought to prevent the move towards central control of science in Britain, which was headed by J.D. Bernal and J.G. Crowther. "The Marxist denial of truth as a value and power in itself was the philosophical fallacy in addition to the practical one that Polanyi saw as the grounds for rejecting what he called Bernalism." (302)

I cannot resist ending with a lengthy quotation from the end of the essay for the benefit of those Convivium readers who may find it difficult to obtain the book for themselves. Scott writes of how Polanyi found the Laplacian view of the world useless as a model for science, since every organised system has its own laws of organisation or order of operation, which control the boundary conditions for the underlying laws of physics, and so are not derivable from these laws.

Hence the world, for Polanyi, is a hierarchy of many levels of complexity and organisation, from elementary particles up to persons and to culture, each higher level being logically independent of the lower.... Among the laws of complex organisation, one should be singled out for its special interest to Polanyi. That is the law of spontaneous ordering such as I have described for the community of scientists for coordinating with each other. Another example is a community of buyers and sellers in a free market coordinating to develop a price structure. And in the evolutionary span, survival efforts, curiosity in the exploration of new ecological niches, and chance mutations all coordinate into the release of the hidden potentialities of the ever-widening family tree of new species.

Within an individual life, new ideas make creative changes, and in fact all of our conscious existence has an irreversible, growing character. Even the premises and methods of science undergo irreversible, creative changes with every act of discovery. We face an indefinite future, as the consequences of our efforts and perceptions of the events around us will unfold in unforeseeable ways. Our security is not to be found in certainty but in faith, faith that we can make even more contact with reality and that we can together face problems, not only the scientific but the technical and especially the human, if we can utilize in community our powers of mind and perception.

The world of scientists and of all human beings, as well as the natural world in which we live is dynamic, creative, unpredictable, and with all its misery, full of enjoyment and hope. This is the message of the chemist and philosopher Michael Polanyi.

Joan Crewdson

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